A NEW AND COMPLETE

DICTIONARY

OF

ARTS and SCIENCES;

COMPREHENDING ALL

The Branches of Useful Knowledge,

WITH

ACCURATE DESCRIPTIONS as well of the various MACHINES, INSTRUMENTS, TOOLS, FIGURES, and SCHEMES necessary for illustrating them,

AS OF

The Classes, Kinds, Preparations, and Uses of NATURAL PRODUCTIONS, whether ANIMALS, VEGETABLES, MINERALS, FOSSILS, or FLUIDS;

Together with

The KINGDOMS, PROVINCES, CITIES, TOWNS, and other remarkable Places throughout the WORLD.

Illustrated with above Three Hundred COPPER-PLATES, engraved by Mr. JEFFERYS, Geographer to His MAJESTY.

The Whole extracted from the Best AUTHORS in all Languages.

By a SOCIETY of GENTLEMEN.

The SECOND EDITION,
With many ADDITIONS, CORRECTIONS, and other IMPROVEMENTS.

Huc undique Gaza
Congeritur ——— VIRG.

VOL. III.

LONDON:
Printed for W. OWEN, at Homer's Head, in Fleet-street.
MDCCLXIV.

W. Musgrave.

MVSEVM
BRITAN
NICVM

A NEW AND COMPLETE

DICTIONARY

OF

ARTS and SCIENCES.

L, or l, the eleventh letter and eighth conſonant of our alphabet. It is a ſemi-vowel, formed in the voice by intercepting the breath between the tip of the tongue and the fore-part of the palate, with the mouth open.

There is ſomething of aſpiration in its ſound, and therefore the Britons uſually double it, or add an *h* to it; as in *llan*, or *lhan*, a temple.

In engliſh words of one ſyllable, it is doubled at the end; as in *all*, *wall*, *mill*, *wooll*, &c. but in words of more ſyllables than one, it is only ſingle at the end; as in *foretel*, *proportional*, &c. It may be placed after moſt of the conſonants, as in *blue*, *clear*, *flame*, &c. but before none of them.

As a numeral letter, L denotes 50; and with a daſh over it, thus, $\overline{L}$, 50000. Uſed as an abbreviature, L ſtands for Lucius; and L. L. S. for a ſeſterce. See the article SESTERCE.

LA, in muſic, the ſyllable by which Guido denotes the laſt ſound of each hexachord: if it begins in C, it anſwers to our A; if in G, to E; and if in F, to D.

LABARUM, in roman antiquity, the ſtandard borne before the roman emperors; being a rich purple ſtreamer, ſupported by a ſpear.

LABDANUM, or LADANUM, a reſin of the ſofter kind, though of too firm a conſiſtence to be ranked among the fluid ones. See the article RESIN.

There are two kinds of it kept in the ſhops; one uſually imported in bladders, to preſerve it in its genuine ſoft conſiſtence, and to prevent the evaporation of its finer parts; another in rolls, much inferior to the former in purity and virtue.

Labdanum ſhould be choſen ſoft and moiſt, of a ſtrong ſmell, pure, very inflammable, and diffuſing a fragrant ſmell while burning. It is a reſinous juice which exſudates from a tree of the ciſtus-kind, and is collected in the following manner: they make a kind of wooden rake, but without teeth, and to this they affix a number of long thongs of untanned leather: this inſtrument they draw ſeveral times over the ſhrubs, during the heat of the day, and afterwards ſcraping off the reſin from theſe thongs, put it up for uſe. What is collected pure and free from duſt, is ſeldom ſold ſo; the peaſants, who ſell it by weight, to increaſe their profit, uſually mixing a kind of duſky-coloured heavy ſand among it.

In medicine it is uſed externally, to attenuate and diſcuſs tumours; internally it is more rarely uſed, but it is greatly extolled by ſome againſt catarrhs, and in dyſenteries: its doſe, in theſe caſes, is from five grains to thirty: it has been made an ingredient in ſeveral of the old compoſitions of the ſhops, but is at preſent much diſuſed.

LABEL, in heraldry, a fillet uſually placed in the middle along the chief of the coat, without touching its extremities. Its breadth ought to be a ninth part of the chief.

chief. It is adorned with pendants; and when there are above three of theſe, the number muſt be ſpecified in blazoning.

This is a kind of addition to the arms of a ſecond brother, to diſtinguiſh him from the firſt, and is eſteemed the moſt honourable of all differences. See plate CLII. fig. 1.

LABEL, in law, a narrow ſlip of parchment hanging from a deed, writ, or other writing, in order to hold the appending ſeal. See the article SEAL.

LABEL *of a circumferentor*, a long thin braſs-ruler, with a ſight at one end, and a center hole at the other; chiefly uſed with a tangent line, to take altitudes.

LABIAL LETTERS, thoſe pronounced chiefly by means of the lips. See the article LETTER.

LABIATED FLOWERS, monopetalous flowers, conſiſting of a narrow tube, with a wide mouth, divided into two or more lips. See BOTANY and FLOWER.

LABIAU, a port-town of Pruſſia, ſituated on a bay of the Baltic ſea, twenty miles north-eaſt of Koningſburg: eaſt long. 22° 15′, north lat. 55°.

LABIUM, LIP, in anatomy. See LIP.

LABORATORY, or ELABORATORY, the chemiſts work-houſe, or the place where they perform their operations; where the furnaces are built, their veſſels kept, *&c.* and in general, the term laboratory, is applied to any place where phyſical experiments in pharmacy, chemiſtry, pyrotechny, *&c.* are performed. See the article FURNACE, *&c.*

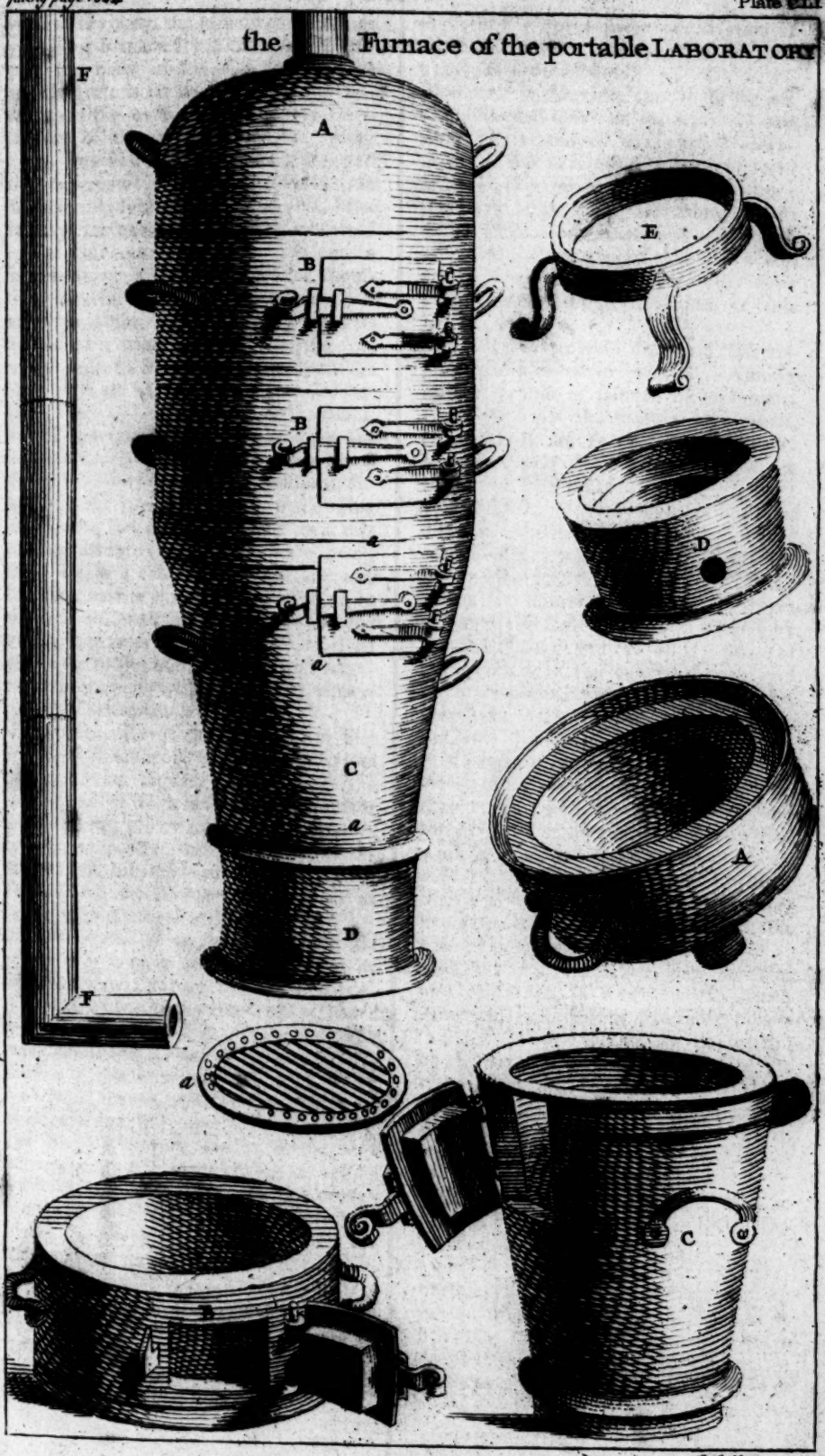
A principal obſtacle to the general exerciſe of chemiſtry being the difficulty of procuring proper furnaces, veſſels, utenſils and materials for the purpoſe, a portable laboratory was introduced by Dr. Shaw, by means of which alone all the chemical operations may be commodiouſly performed. This laboratory conſiſts of three parts, *viz.* a furnace, an apparatus, and a materia chemica. The furnace, an internal and external view of which is repreſented in plate CLI. has four principal parts. 1. The cover A, with its upright funnel. 2. The two rings BB. 3. The body C. And, 4. The foot D. The general office and uſe of the cover is to check, ſuppreſs, and throw back the heat and flame, or prevent the fuel from ſpending itſelf too faſt, as it otherwiſe would do, with little effect in many operations. In order to encreaſe the draught, and ſqueeze the air more forcibly through the body of the fuel, there is a moveable chimney F F, that may occaſionally be fixed to the orifice left for that and other purpoſes in the top of the cover. The ring is the ſeat of numerous operations; the ſubject to be acted on by the fire being frequently lodged therein; and in other caſes it helps to enlarge the furnace, and render it capable of operations, which it could not otherwiſe perform. The body ſerves to contain the fuel, and is the common ſeat of the fire. In many caſes of fuſion, as in running of metals from their ore, it performs at the ſame time the office of a crucible, and contains the ſubject mixed along with the fuel, after the manner practiſed in the ſmelting-houſes. To this body belong three ſeveral grates, *a*, *a*, *a*, that may be placed at differents heights therein, according to the nature of the operation, and the diſtance required between the ſubject and the fire. Laſtly, the foot, whereof there are two kinds, D and E, is not only of uſe in ſupporting the other parts, but alſo in receiving the aſhes of the fuel and the melted matters that, by the fire, are made to flow and run down into it; and thus performing the office of a receiver, it is of ſingular uſe in collecting and preſerving ſubſtances that might otherwiſe be ſpilt or loſt.

The more immediate appurtenances of this furnace are fuel and bellows. The fuel may be charcoal; or as there is a contrivance for a vent or flew in the body of the furnace, common ſea-coal may be employed, and the ſmoke directed up the chimney of the room where the furnace is to ſtand. Its ſtructure is alſo well fitted for a lamp, which in many caſes, as particularly ſome curious digeſtions and calcinations, is highly neceſſary; and by this means alſo may the operations which would otherwiſe require the athanor, or a long continued uniform heat, be elegantly performed.

It would be tedious to ſhew how all the numerous operations of chemiſtry are performable by means of this furnace: it may ſuffice to conſider the general ſtates or conditions into which the inſtrument may be put for the principal of them. The ſimpleſt ſtate of this furnace is a combination of two parts, the body and the foot, which is thus fit for fuſion, by the naked fire, when the matter to be melted is mixed among the fuel, as in running the ores of lead, tin, or iron, for inſtance. By barely placing the middle

grate

the Furnace of the portable LABORATORY



T. Jefferys sculp

BRITISH MUSEUM

grate in the body, the inſtrument becomes a melting-furnace for a crucible. When only the body of the furnace with its middle grate is ſet upon the foot, it anſwers all the ends of the common ſhop-furnace of the apothecaries for decoctions, inſpiſſations, extraction, &c. and the purpoſes of a naked fire for certain diſtillations, ſublimations, and the like. It may moreover be readily converted into a balneum mariæ, an aſh-pot, a ſand-heat, or a ſtill ſtronger for digeſtion, &c. by barely ſetting upon it a pan of water, aſhes, ſand, or iron-filings. If inſtead of a common pan, the ring furniſhed with its ſet of pots be ſet upon the body with its grate, you have a furnace fitted for diſtillation in capella vacua, where the retorts are contained in the cavity of the pots, and locked down therein without any viſible medium between. An iron-pan placed in the room of the ring juſt mentioned, makes a calcining furnace; the loweſt grate being uſed, either a cold ſtill or a hot one may be put into the body, and worked as in the common manner, with its proper head and refrigeratory. The application of the cover to the hollow ring, and ſometimes to the body without the ring, makes a proper reverberatory furnace.

The outer caſe of this furnace is beſt made of plated iron, formed in ſeparate pieces of the figures expreſſed in the plate, and of ſuch a ſize as the operator ſhall chooſe, obſerving the ſame proportion between the parts as the plate exhibits: the inner ſide of all the parts are to be lined, the thickneſs of an inch at leaſt, with a proper luting.

All the chemical apparatus may be divided into remote and intermediate, or ſuch as is preparatory to the operations, and ſuch as is actually employed therein: the remote apparatus of this portable furnace conſiſts of ſcales, weights and meaſures; alſo mortars, ſieves, raſps, files, hammers, ſheers, and forceps. Next to theſe are the inſtruments for managing the fire, as ſhovels, hooks, tongs, and blow-pipes. Alſo for charging the veſſels with the ſubject matters of the operations, as ſhells, horns, tin-plates, bruſhes, hares-feet, &c. alſo for emptying the productions, hooked tongs, ingots, cones, baſons, funnels, &c. In the laſt place come the inſtruments for making certain utenſils, as cores for muffles, moulds for teſts, crucibles and melting pots, and irons for cutting glaſſes and the necks of retorts. For a proper deſcription of theſe inſtruments, utenſils, &c. ſee each under its proper head.

The materia chemica, that is the ſubject to be worked upon or immediately and materially employed in chemical operations, is the next thing to be conſidered as the conſtituent parts of a laboratory: this is a large field, and comprehends all the natural bodies on our globe, which are all ſubject matters of chemiſtry; and are all ſeparately treated of under their proper heads through the courſe of this work.

LABOUR, in general, denotes a cloſe application to work or buſineſs. Among ſeamen a ſhip is ſaid to be in labour, when ſhe rolls and tumbles very much, either a hull, under ſail, or at anchor. It is alſo ſpoke of a woman in travel, or child-birth. See DELIVERY.

LABOURER, generally ſignifies one that does the moſt ſlaviſh and leſs artful part of a laborious work, as that of huſbandry, maſonry, &c.

An antient ſtatute ordains, that the wages of labourers ſhall be yearly aſſeſſed by the ſheriff and juſtices of the peace of every county in the eaſter-ſeſſions; and in corporations, by head officers; and if they take work by the great, and leave the ſame unfiniſhed, except it be for the non-payment of wages, or where they are employed in the king's ſervice, &c. they ſhall be impriſoned one month, and forfeit 5l. The hours that labourers ſhall work in the day are alſo appointed, on pain of forfeiting one penny for every hour's abſence: and all labourers may be compelled to ſerve by the day in the time of corn and hay-harveſt.

LABRADOR, alſo called New Britain, and Eſkimaux, is a country in North America, bounded by Hudſon's Straits and the Atlantic Ocean, on the north; by the ſame ocean, on the eaſt; by the river of St. Lawrence and Canada, on the ſouth; and by Hudſon's bay, on the weſt: ſituated between 59° and 79° of weſt long. and between 50° and 64° of north lat.

LABRAX, in ichthyology, a ſpecies of pearch, with fourteen rays in the fin beſides the anus. See PEARCH.

LABRUS, in ichthyology, a genus of acanthopterygious fiſhes, with ſix bony rays in the membrane of the gills; add to this, that the lips are thick, and the rays of the back-fin anteriorly double.

The name labrus is given to the fiſhes of this

this genus, on account of the thickneſs of their lips.

LABURNUM, in botany, is only a ſpecies of cytiſus. See CYTISUS.

LABYRINTH, in anatomy, the internal cavity of the ear, ſo called from ſinuoſities and windings. See EAR.

LABYRINTH, in gardening, a winding mazy walk between hedges, through a wood or wilderneſs. The chief aim is to make the walks ſo perplexed and intricate, that a perſon may loſe himſelf in them, and meet with as great a number of diſappointments as poſſible. They are rarely to be met with, except in great and noble gardens, as Verſailles, Hampton court, &c.

There are two ways of making them; the firſt is with ſingle hedges: this method has been practiſed in England: and theſe may, indeed, be beſt, where there is but a ſmall ſpot of ground allowed for making them; but where there is ground enough, the double is moſt eligible. Thoſe made with double hedges, with a conſiderable thickneſs of wood between them, are approved as much better than ſingle ones: this is the manner of making them in France and other places; of all which that of Verſailles is allowed to be the nobleſt of its kind in the world. It is an error to make them too narrow; for that makes it neceſſary to keep the hedges cloſe clipt: but if, according to the foreign practice, they are made wide, they will not ſtand in need of it. The walks are made with gravel uſually ſet with horn-beam: the paliſades ought to be ten, twelve, or fourteen feet high: the hornbeam ſhould be kept cut, and the walks rolled.

LAC, MILK, among phyſicians, &c. See the article MILK.

The appellation lac is alſo given to ſeveveral chemical preparations, as, 1. Lac ammoniaci, which is ordered by the college to be made in the following manner: take of gum ammoniac, two drams; of ſimple penny-royal water, half a pint; and rub the gum in a mortar with the water, till it is diſſolved, which it will do without heat. 2. Lac ſulphuris, called alſo precipitated ſulphur. See SULPHUR.

LAC LUNÆ, in natural hiſtory, a name ſometimes given to mineral agaric. See the article AGARIC.

LACCA, in natural hiſtory, &c. a vegetable production, improperly called gum, as being inflammable, and not ſoluble in water.

There are three kinds of lacca kept in the ſhops, which are all the products of a ſpecies of ziziphus. See ZIZIPHUS. The ſtick-lacca is a hard, reſinous, and friable ſubſtance, of an uneven and granulated ſurface, and of a roundiſh but ſomewhat duſky colour. It is of an auſtere and ſubaſtringent taſte, and is fixed round certain ſticks, and branches of a woody ſubſtance. The ſeed-lacca is brought to us in looſe grains, or little maſſes, of a roundiſh irregular figure, and of a reddiſh colour, which ſeem no way different from the ſtick-lacca, but as parts from the whole. The third kind, or ſhell-lacca, is met with in thin and tranſparent cakes, made by melting the above granules, or what is taken from the ſticks, into a maſs. Some affirm that it exſudes from the jujube, and ſeveral other trees of the ſame genus; but others aſſert that it is no vegetable exſudation at all, but a ſubſtance analogous to wax laid on theſe branches by inſects. Till we have ſome very good obſerver on the ſpot, to determine between the poſitive aſſertions of the ſeveral authors who have wrote upon it, we muſt be contented to reſt in uncertainty: but whatever may be the hiſtory of this drug, its virtues are leſs in diſpute; it is an attenuant, aperient, and diuretic, and is ſometimes preſcribed in diſorders of the liver and ſpleen, and in jaundices and dropſies. It would probably be in more uſe, if we knew how to open its body, ſo as to make it exert its virtues; for it is a ſort of unchangeable medicine which paſſes the body very little altered, if given in ſubſtance; and it is of the number of thoſe things from which a tincture is very difficultly extracted. But beſides theſe virtues, a beautiful red colour is prepared from it by only boiling ſtick-lacca in water, and then filtrating the decoction, and evaporating the ſuperfluous humidity. This lacca is of great uſe in painting, on which account its name has been given to ſeveral colours procured from other ingredients in much the ſame manner.

Artificial LACCA, or LAKE, a colouring drug obtained from certain vegetables.

Of theſe there are different kinds. 1. To make a fine red lake: take half a pound of good brazil, boil it in three pints of lye, made of the aſhes of vine-ſprigs, till it be half evaporated, then let it ſettle and ſtrain it off. Then boil it again with freſh brazil, a quarter of a pound; cochineal,

cochineal, two pounds; and terra merita, half an ounce; adding to it a pint of fair water; let it boil till it be half evaporated as before, then ſet it by to ſettle and ſtrain it. But when you take it off the fire, put in half an ounce of burnt alum reduced to an impalpable powder; let it diſſolve, ſtirring it with a ſtick, and add to it a quarter of a dram of arſenic. In order to give it a body, reduce two cuttle-fiſh bones to a fine powder, put it in, and leave it to dry at leiſure, and then grind it with a good quantity of fair water, in which leave it to ſteep; afterwards ſtrain it through a cloth, make it up into ſmall cakes, and ſet them to dry on cards or paſte-board. If you would have this lake redder, add to it lemon-juice; and if you would have it deeper, add to it oil of tartar. 2. To make columbine-lake: ſteep half a pound of the fineſt brazil wood of Fernambouc, raſped in three pints of the moſt ſubtilely diſtilled vinegar, for at leaſt a month, and if it be for ſix weeks, it will be the better. After which, boil all in balneo mariæ for about a minute, and leave it for a day or two; after which, put a quarter part of alum-powder into a very clean earthen pan, and ſtrain the liquor upon it through a cloth, and ſo let it remain for a day; then heat the whole till it ſimmers, and leaving it again for twenty four hours, reduce two cuttle-fiſh bones into powder, and having warmed the liquor, pour it upon them; then ſtir the whole with a ſtick till it is cool, and leave it again for twenty-four hours before you ſtrain it. 3. To make lake of turmeric: take a pound of turmeric-root, reduced to a fine powder, three pints of fair water, and an ounce of ſalt of tartar; put them into a glazed earthen veſſel, and let them boil together gently over a clear fire, till the water appears richly impregnated with the turmeric, or will ſtain a piece of white paper beautifully yellow; then filter the liquor, and gradually add to it a ſtrong aqueous ſolution of roach-alum, till the yellow matter is all curdled together, or precipitated; after this filtre the whole through paper, when the aqueous part will run off, and leave a yellow matter behind; which being edulcorated, or waſhed in the filtre, by the repeated affuſion of freſh water, till the water comes away inſipid; and being afterwards dried, it becomes a beautiful yellow for painting.

LACE, in commerce, a work compoſed of many threads of gold, ſilver or ſilk, interwoven the one with the other, and worked upon a pillow with ſpindles, according to the pattern deſigned. The open work being formed with pins, which are placed and diſplaced as the ſpindles are moved. See the article GOLD-THREAD.

The importation of gold and ſilver-lace is prohibited.

Bone-LACE, a lace made of fine linen thread or ſilk, much in the ſame manner as that of gold and ſilver. The pattern of the lace is fixed upon a large round pillow, and pins being ſtuck into the holes or openings in the pattern, the threads are interwoven by means of a number of bobbins made of bone or ivory, each of which contains a ſmall quantity of fine thread, in ſuch a manner as to make the lace exactly reſemble the pattern. There are ſeveral towns in England, and particularly in Buckinghamſhire, that carry on this manufacture; but vaſt quantities of the fineſt laces have been imported from Flanders.

The duties on foreign bone-lace are as follow: bone-lace of thread, the dozen yards pays, on importation, 15s. $4\frac{30}{100}$d. and draws back, on exportation, 13s. 6d. Purl or antlet-lace of thread, the groce, pays 3s. $10\frac{20}{100}$d. Silk bone lace the pound, containing ſixteen ounces, pays 11l. 10s. $10\frac{1}{2}$d.

LACE is alſo uſed for a kind of chord made of ſilk or cotton, chiefly uſed in lacing womens ſtays.

LACEDEMON, the antient name of Miſithra. See the article MISITHRA.

LACERTA, the lizard, in zoology. See the article LIZARD.

LACHNÆA, in botany, a genus of the octandria-monogynia claſs of plants, without any flower petals: there is no pericarpium; the ſeed, which is ſingle, oval, and obliquely acute, being contained in the bottom of the cup. It differs from the paſſerina only in having its cup divided into unequal ſegments.

LACHNIS, in natural hiſtory, a genus of fibrariæ; being fibroſe, unelaſtic bodies, compoſed of ſhort or abrupt filaments. See the article FIBRARIÆ.

LACHRYMAL, in anatomy, an appellation given to ſeveral parts of the eye, from their ſerving to ſecrete the tears. The lachrymal gland is ſituated in the orbit above the ſmaller angle, and its excretory ducts under the upper eye-lid: theſe are much more eaſily demonſtrated in

in the eye of an ox, than in a human one. The lachrymal caruncle is ſituated in the larger angle, or canthus, ſerving to direct the tears to the two puncta lachrymalia; which are ſituated in the ſame angle, at the extremities of the tarſi or cartilages, and terminate in the lachrymal ſaccus, the naſal canal, and in the noſe itſelf. See the article EYE.

LACHRYMALIS FISTULA, in ſurgery and medicine. See FISTULA.

LACHRYMATORY, in antiquity, a veſſel wherein were collected the tears of a deceaſed perſon's friends, and preſerved along with the aſhes and urn.

LACINIATED-LEAF, among botaniſts, expreſſes a leaf which has ſeveral ſinuſes down to the middle, and, the lobes which ſeparate theſe not ſmooth but notched, or indented. See LEAF.

LACONISM, λακωνισμος, in matters of ſtyle, a ſhort, pithy obſervation or ſaying; ſo called from the Lacedæmonians, who were remarkable for the conciſeneſs of their diſcourſe. See STYLE.

LACRYMAL, or LACHRYMAL. See the article LACHRYMAL.

LACTEA, or VIA LACTEA, the ſame with galaxy. See GALAXY.

LACTEAL VESSELS, in anatomy, fine ſubtile canals ſituated in the inteſtines and meſentery, and ſerving to convey the chyle to its deſtined place. See the the article CHYLE.

Aſellius, who demonſtrated them in 1622, has the honour of paſſing for the firſt diſcoverer of them; but they were long before obſerved by Eraſiſtratus and Galen, who took them for arteries containing milk.

The moſt convenient method of demonſtrating them, is in comparative anatomy, by feeding ſome animal plentifully; and, in about three hours afterwards, ſtrangling it. In this caſe, they are all turgid with chyle: whereas, at other times, they are filled with a lymphatic juice, not with chyle; and accordingly are called lymphatics, not chyliferous veſſels.

The origin of theſe veſſels is from the inteſtines, and principally from the ſmall ones: in all theſe they are extremely numerous, but few or none of them can be ſeen in the larger guts.

Anatomiſts diſtinguiſh two kinds of them, which they call lacteals of the firſt and ſecond order. Thoſe of the firſt order, are ſuch as run from the inteſtines to the glands of the meſentery: thoſe of the ſecond order, are ſuch as run from the glands to the receptacles and thoracic duct, where they terminate. Theſe laſt are larger than the former, but they are fewer in number. See DUCT, THORACIC, CHYLIFICATION, &c.

LACTIFEROUS, an appellation given to plants abounding with a milky juice, as the ſow-thiſtle, and the like.

LACTUCA, LETTUCE, in botany. See the article LETTUCE.

LACUNÆ, in anatomy, certain oſcular orifices, proceeding from the glandulæ ſubſtratæ in the vagina, and often ſo large as to admit a briſtle. Their uſe is to ſecrete a fluid for lubricating the vagina, and ſtimulating to venery.

LACUNAR, in architecture, an arched roof or ceiling, more eſpecially the planking or flooring above porticos and piazzas.

LADANUM, or LABDANUM, in pharmacy. See the article LABDANUM.

LADENBURG, a town of Germany, ſituated on the river Neckar, eight miles north-weſt of Heidelburg.

LADING, in merchandize, &c. taken into a ſhip, for which the maſter gives a bill of lading. See the article BILL.

LADOGA LAKE, in ruſſian Finland, communicates with the gulph of Finland by the river Nieva.

LADOGNA, or LACEDOGNA, a city and biſhop's ſee of the kingdom of Naples, fifty-five miles eaſt of the city of Naples.

LADRONE ISLANDS, are ſituated in the Pacific Ocean, between 12° and 28° of north lat. and about 140° eaſt long.

LADY'S BEDSTRAW, a plant called by botaniſts gallium. See GALLIUM.

LADY'S BOWER, the ſame with clematis, or virgin's bower.

LADY-COW, in zoology. See the article HEMISPHÆRIA.

LADY'S COMB, a plant otherwiſe called ſcandix. See the article SCANDIX.

LADY'S MANTLE, the engliſh name of the alchimilla. See ALCHIMILLA.

LADY'S SEAL, a name by which ſome call tamnus. See the article TAMNUS.

LADY'S SMOCK, the engliſh name of cardamine. See the article CARDAMINE.

LADY'S SLIPPER, the engliſh name of the cypripedium. See CYPRIPEDIUM.

LADY'S TRACES, a name by which ſome call orchis. See the article ORCHIS.

LADY-DAY, in law, the 25th of March, being the annunciation of the holy virgin. See ANNUNCIATION.

LAGAN, or LAGON, in law. See the article FLOTSON.

LAGANUM, in natural hiſtory, a genus of the echini marini, or centronia, with their mouth in the middle of the baſe of the ſhell. See CENTRONIA.

LAGOCEPHALUS, in ichthyology, a ſpecies of globe-fiſh, ſo called from its head being ſomething like that of a hare. See the article ORBIS.

LAGOECIA, ROUND-HEADED CUMMIN, in botany, a genus of the pentandria-monogynia claſs of plants, the flower of which conſiſts of five petals, very ſhort, and bicornate: there is no pericarpium, the ſeed, which is ſingle, being contained in the cup.

This plant has neither the ſmell, appearance, or taſte of cummin; its ſmell being more like that of the carrot.

LAGOPHTHALMIA, in ſurgery, an everſion and gaping of the eye-lids, otherwiſe called ectropium. See the article ECTROPIUM.

LAGOPUS, in ornithology, a ſpecies of tetrao, the whole body of which, excepting the tail, is white; the tail too is white, or at leaſt tipped with white. It is about the ſize of a tame pigeon.

LAGOS, a port-town of Portugal, in the province of Algarva: weſt long. 9° 27′, north lat. 36° 45′.

LAGURUS, in botany, a genus of the triandria-digynia claſs of plants, the flower of which conſiſts of two oblong valves, and ſerves as a pericarpium to incloſe the ſeed, which is ſingle and ariſtated.

LAHOLM, a port-town of Gothland, in Sweden, ſixty miles north of Copenhagen.

LAHOR, the capital of a province of the ſame name in the hither India: eaſt long. 75°, and north lat. 33°.

LAIR, among ſportſmen, the place where the deer harbour by day. This term is alſo uſed to ſignify a place where cattle uſually reſt under ſome ſhelter: by which means the ground generally becomes enriched with their dung.

LAKE, a collection of waters contained in ſome cavity in an inland place, of a large extent, ſurrounded with land, and having no communication with the ocean. Lakes may be divided into four kinds, 1. Such as neither receive nor ſend forth rivers. 2. Such as emit rivers, without receiving any. 3. Such as receive rivers, without emitting any. And 4. Such as both receive and ſend forth rivers.

Of the firſt kind, ſome are temporary and others perennial: moſt of thoſe that are temporary owe their origin to the rain, and the cavity or depreſſion of the place in which they are lodged; thus in India there are ſeveral ſuch lakes made by the induſtry of the natives, of which ſome are a mile, and ſome two in circuit; theſe are ſurrounded with a ſtone wall, and being filled in the rainy months, ſupply the inhabitants in dry ſeaſons, who live at a great diſtance from ſprings or rivers. There are alſo ſeveral of this kind formed by the inundations of the Nile and the Niger; and in Muſcovy, Finland, and Lapland, there are many lakes formed partly by the rains and partly by the melting of the ice and ſnow: but moſt of the perennial lakes which neither receive nor emit rivers, probably owe their riſe to ſprings at the bottom, by which they are conſtantly ſupplied.

The ſecond kind of lakes, which emit, without receiving rivers, is very numerous. Many rivers flow from theſe as out of ciſterns; where their ſprings being ſituated low within a hollow place, firſt fill the cavity and make it a lake, which not being capacious enough to hold all the water, it overflows and forms a river: of this kind is the Wolga, at the head of the river Wolga; the lake Odium, at the head of the Tanais; the Adac, from whence one branch of the river Tigris flows; the Ozero, or White lake in Muſcovy, is the ſource of the river Shackna. The great lake Chaamay, which emits four very large rivers, which water the countries of Siam, Pegu, &c. *viz.* the Menan, the Aſa, the Caipoumo, and the Laquia, &c.

The third ſpecies of lakes, which receive rivers but emit none, apparently owe their origin to thoſe rivers which in their progreſs from their ſource, falling into ſome extenſive cavity, are collected together, and form a lake of ſuch dimenſions, as may loſe as much by exhalation, as it continually receives from theſe ſources: of this kind is that great lake improperly called the Caſpian ſea; the lake Aſphaltites, alſo called the Dead ſea; the lake of Geneva, and ſeveral others.

Of the fourth ſpecies, which both receive and emit rivers, we reckon three kinds, as the quantity they emit is greater, equal, or leſs than they receive. If it be greater, it is plain that they muſt be ſupplied by ſprings at the bottom; if leſs, the ſurplus of the water is probably

ſpent in exhalations; and if it be equal, their ſprings juſt ſupply what is evaporated by the ſun.

Lakes are alſo divided into thoſe of freſh water, and thoſe of ſalt. Dr. Halley is of opinion, that all great perennial lakes are ſaline, either in a greater or leſs degree; and that this ſaltneſs encreaſes with time: and on this foundation he propoſes a method for determining the age of the world.

Large lakes anſwer the moſt valuable purpoſes in the northern regions, the warm vapours that ariſe from them moderating the pinching cold of thoſe climates; and what is ſtill a greater advantage, when they are placed in warmer climates at a great diſtance from the ſea, the exhalations raiſed from them by the ſun, cauſe the countries that border upon them to be refreſhed with frequent ſhowers, and conſequently prevent their being barren deſarts.

LALAND, an iſland of Denmark, ſituated ſouth of Zeland, from which it is ſeparated by a narrow canal: eaſt long. 12°, north lat. 55°.

LAMA, the ſovereign pontiff or rather god of the aſiatic Tartars, inhabiting the country of Barantola. The lama is not only adored by the inhabitants of the country, but alſo by the kings of Tartary, who ſend him rich preſents, and go in pilgrimage to pay him adoration, calling him *lama-congiu*, i. e. god the everlaſting father of heaven. He is never to be ſeen but in a ſecret place of his palace, amidſt a great number of lamps, ſitting croſs legged upon a cuſhion, and adorned all over with gold and precious ſtones; where, at a diſtance, they proſtrate themſelves before him, it not being lawful for any to kiſs even his feet. He is called the great lama, or lama of lamas, that is, prieſt of prieſts. And to perſuade the people that he is immortal, the inferior prieſts, when he dies, ſubſtitute another in his ſtead, and ſo continue the cheat from generation to generation. Theſe prieſts perſuade the people, that the lama was raiſed from death many hundred years ago, that he has lived ever ſince, and will continue to live for ever.

LAMB, in zoology, the young of the ſheep-kind. See the article SHEEP.

A male lamb of the firſt year is called a wedder-hog, and the female, a ewe-hog; the ſecond year it is called a wedder, and the female a ſheave. If a lamb be ſick, mare's milk with water may be given it; and by blowing into the mouth, many have been recovered after appearing dead. The beſt ſeaſon for weaning them, is when they are ſixteen or eighteen weeks old; and about Michaelmas, the males ſhould be ſeparated from the females, and ſuch males as are not deſigned for rams, gelded.

LAMBALLA, a town of France, twenty-three miles ſouth-weſt of St. Malo.

LAMBDOIDES, in anatomy, one of the ſutures of the ſkull. See SKULL.

LAMBESSE, a town of Provence, in France, nine miles north of Aix.

LAMEGO, a city of Portugal: weſt long. 8° 6′, north lat. 41° 15′.

LAMELLÆ, in natural hiſtory, denotes very thin plates, ſuch as the ſcales of fiſh are compoſed of.

LAMENESS, among farriers. See the article HALTING.

LAMENTATIONS, a canonical book of the Old Teſtament, written by the prophet Jeremiah. The two firſt chapters of this book are employed in deſcribing the calamities of the ſiege of Jeruſalem. In the third, the author deplores the perſecutions he himſelf had ſuffered. The fourth turns upon the deſolation of the city and temple, and the misfortune of Zedekiah. The fifth chapter is a prayer for the Jews in their diſperſion and captivity; and at the end of all, he ſpeaks of the cruelty of the Edomites, who had inſulted Jeruſalem in her miſery. The four firſt chapters of the lamentations are an abecedary, every verſe or couplet beginning with one of the letters of the hebrew alphabet, in the alphabetical order. The ſubject is of the moſt moving kind, and the ſtile throughout lively, pathetic, and affecting. "Did we ever find, ſays "Dr. South, ſorrow flowing forth in "ſuch a natural prevailing pathos, as in "the Lamentations of Jeremy? One "would think, that every letter was "wrote with a tear; that every word "was the noiſe of a breaking heart; "that the author was a man compacted "of ſorrows, diſciplined to grief from "his infancy; one who never breathed "but in ſighs, nor ſpoke but in a groan."

LAMIA, in ichthyology, a name given to the white ſhark. See SHARK.

LAMIÆ, in heathen mythology, a kind of dæmons, in the form of women, ſaid to have devoured children. See DÆMON.

LAMINÆ, in phyſiology, the thin plates whereof many ſubſtances conſiſt.

LAMIODONTES, in natural hiſtory, the ſame

ſame with the gloſſopetra. See the article GLOSSOPETRA.

LAMIUM, DEAD NETTLE, in botany, a genus of the didynamia gymnoſpermia claſs of plants, the flower of which conſiſts of one labiated and ringent petal: the ſeeds are four, triangular, and contained in the bottom of the cup.

The flowers of this plant are ſaid to be good in the fluor albus, dyſentery, and ſcrophulous diſorders. The herb is aperient, emollient, and vulnerary.

LAMMAS-DAY, a feſtival celebrated on the firſt of Auguſt by the romiſh church, in memory of St. Peter's impriſonment.

LAMP, λαμπας, a veſſel containing oil, with a lighted wick. See the articles OIL, FLAME, FIRE, &c.

Dr. St. Clair, in Phil. Tranſ. n° 245, gives the deſcription of an improvement upon the common lamp. He propoſes that it ſhould be made two or three inches deep, with a pipe coming from the bottom almoſt as high as the top of the veſſel: let it be filled ſo high with water as to cover the hole of the pipe at the bottom, that the oil may not get in at the pipe, and ſo be loſt. Then let the oil be poured in, ſo as to fill the veſſel almoſt brim full, which muſt have a cover pierced with as many holes as there are wicks deſigned. When the veſſel is thus filled, and the wicks are lighted, if water falls in by drops at the pipe, it will always keep the oil at the ſame height, or very near; the weight of the water being to that of the oil as 20 $\frac{3}{11}$ to 19, which in two or three inches makes no great difference. If the water runs faſter than the oil waſtes, it will only run over at the top of the pipe, and what does not run over will come under the oil, and keep it at the ſame height.

Rolling-LAMP, a machine A B (plate CLII. fig. 2.) with two moveable circles D E, F G, within it; whoſe common center of motion and gravity is at K, where their axis of motion croſs one another. If the lamp K C, made pretty heavy and moveable about its axis H I, and whoſe center of gravity is at C, be fitted within the inner circle, the common center of gravity of the whole machine will fall between K and C; and by reaſon of the pivots A, B, D, E, H, I, will be always at liberty to deſcend: hence, though the whole machine be rolled along the ground, or moved in any manner, the flame will always be uppermoſt, and the oil cannot ſpill.

It is in this manner they hang the compaſs at ſea, and thus ſhould all the moon-lanterns be made, that are carried before coaches, chaiſes, and the like.

LAMP-BLACK, among colourmen. See the article BLACK.

LAMPADARY, an officer in the antient church of Conſtantinople, ſo called from his employment, which was to take care of the lamps, and to carry a taper before the emperor or patriarch when they went to church, or in proceſſion.

LAMPAS, LAMPERS, or LAMPRASS, among farriers, a ſwelling and inflammation in the roof of a horſe's mouth, ſo called becauſe it is cured by burning with a lamp or hot iron, in which operation great care ſhould be taken not to touch the bone.

LAMPERN, in ichthyology, a ſpecies of petromyzon, with a ſingle row of little teeth in the verge of the mouth, beſide the lower large ones. It grows to about a foot long, though moſt of thoſe uſually caught are under that ſtandard. See the article PETROMYZON.

LAMPREY, *lampetra*, another ſpecies of petromyzon, with about twenty rows of teeth. It grows to two feet and an half, or more in length. It is caught in ſome large rivers near the ſea, but is much leſs frequent than the former ſpecies.

LAMPSACUS, a port-town of the leſſer Aſia, at the entrance of the Propontis, oppoſite to Gallipoli, ſituated eighty miles ſouth-weſt of Conſtantinople: eaſt long. 28°, north lat. 40° 12′.

LANCASTER, the county-town of Lancaſhire: weſt long. 2° 44′, north lat. 54°. It ſends two members to parliament.

LANCEOLATED LEAF, one reſembling a ſpear's point.

LANCET, a chirurgical inſtrument, ſharp-pointed, and two-edged, chiefly uſed for opening veins in the operation of phlebotomy, or bleeding; alſo for laying open abceſſes, tumours, &c.

A ſurgeon ſhould never be without ſome of theſe of different ſizes. See two repreſented in plate CLII. fig. 3.

LANCHANG, the capital of the kingdom of Laos, in the further India: eaſt long. 101°, north lat. 20°.

LANCIANO, a city of Italy, in the kingdom of Naples, ſituated near the gulph of Venice: eaſt long. 15° 25′, north lat. 42° 20′.

LAND, in a limited ſenſe, denotes arable ground. See the articles EARTH, SOIL, HUSBANDRY, &c.

It is alſo uſed for meadow-ground, paſture, wood, commons, &c. See the articles MEADOW, PASTURE, &c.

LAND, in the ſea-language, makes part of ſeveral compound terms: thus *land laid*, or to lay the land, is juſt to loſe ſight of it. *Land-locked*, is when land lies all round the ſhip, ſo that no point of the compaſs is open to the ſea: if ſhe is at anchor in ſuch a place, ſhe is ſaid to ride land locked, and is therefore concluded to ride ſafe from the violence of winds and tides. *Land mark*, any mountain, rock, ſteeple, tree, &c. that may ſerve to make the land known at ſea. *Land is ſhut in*, a term uſed to ſignify that another point of land hinders the ſight of that the ſhip came from. *Land to*, or the ſhip lies land to, that is, ſhe is ſo far from ſhore that it can only be juſt diſcerned. *Land turn*, is a wind that in almoſt all hot countries blows at certain times from the ſhore in the night. *To ſet the land*, that is, to ſee by the compaſs how it bears.

LANDAFF, a city and biſhop's ſee of Glamorganſhire, in ſouth Wales, twenty-ſix miles north-weſt of Briſtol: weſt long. 3° 20′, north lat. 51° 33′.

LANDAU, a city of Germany, in the circle of the Upper-Rhine, and landgravate of Alſace, ſituated fifteen miles ſouth-weſt of Spire: eaſt long. 8°, north lat. 49° 12′.

LANDEN, a ſmall town of the auſtrian Netherlands, in the province of Brabant, eighteen miles ſouth eaſt of Louvain, and twenty miles north of Namur.

LANDGRAVE, the german name for a count or earl, that has the government of a province, country, or large tract of land.

LANDGRAVIATE, or LANDGRAVATE, the office, authority, juriſdiction, or territory of a landgrave.

LANDRECY, a town of the french Netherlands, in the province of Hainault: eaſt long. 3° 25′, north lat. 50° 5′.

LANDSCROON, a port town of Sweden, in the province of Gothland, and territory of Schonen, ſituated on the Baltic ſea, within the Sound; eaſt long. 14° 20′, north lat. 55° 42′.

LANDSHUT, a city of Germany, and the capital of Lower Bavaria, ſituated forty miles north-eaſt of Munich; eaſt long. 12° 6′, north lat. 48° 30′.

LANDSKIP, or LANDSCAPE, in painting, the view or proſpect of a country, extended as far as the eye will reach.

Landſkips are eſteemed one of the loweſt branches of painting, repreſenting ſome rural ſcene, as hills, valleys, rivers, country-houſes, &c. where human figures are only introduced as accidents.

In painting landſkips the following rules will be found of uſe. 1. Always expreſs a fair horizon, ſhewing the heavens cloudy or clear, more or leſs, according to the occaſion; and if the ſun is expreſſed at all, let it be either at riſing or ſetting, and as it were behind or over ſome hill. The moon and ſtars are ſeldom or never depicted, unleſs in twilight-pieces, becauſe all things are ſuppoſed to be ſeen by day. 2. Obſerve to make the ſun's light reflect upon all the objects the ſame way, and the ſhadows to fall the contrary way. 3. Take care to augment or leſſen things proportionally, as they are ſuppoſed to be nearer or farther from the eye. 4. In expreſſing things at large diſtances, as ten, twenty, or thirty miles off, where the object is hard to be diſcerned; as whether it be temple, caſtle, houſe, or the like, ſhew no particular ſigns thereof, or any eminent diſtinction, but rather as weakly, faintly, and confuſedly, as the eye judges of it. 5. If landſkips be laid in colours, the farther you go, the more you muſt lighten it with a thin and airy blue, to make it ſeem as if it were afar off, beginning at firſt with a dark green, ſo driving it by degrees into a blue, according to the diſtance. 6. Make your landſkip to ſhoot, as it were, one part lower than another, making the neareſt place or hill higheſt, and thoſe that are farther off to ſhoot away under that, that the landſkip may appear to be taken from the top of an hill. 7. Let every thing have its proper motion, as in trees when they are ſhaken with the wind, making the ſmaller boughs yielding, the ſtiffer leſs bending; in clouds, that they follow the winds; in rivers, the general current, and flaſhing of the waters againſt the boat-ſides. 8. In the ſea, the waves and other proper agitations, the rolling of the billows, the tumbling of veſſels up and down, the ſhips floating, ſome dipt, ſome half drowned, ſome ſtanding almoſt an end, ſome hid almoſt with the waves, by means of the uncertainty of the ſurges, others endeavouring to live. 9. In the motion of waters falling from an high place, but eſpecially when they fall upon rocks and ſtones, you muſt repreſent it leaping up into the air, and

ſprink-

ſprinkling all about: laſtly, let every thing that moves, whether eſſentially or accidentally, have its proper repreſentation. 10. Let the work imitate the ſeaſon it is intended to repreſent; as if you intend it for a winter-piece, repreſent felling of woods, ſliding upon the ice, fowling by night, hunting of bears or foxes in the ſnow, making the trees every where naked or laden with ſnow or a hoar froſt; the earth bare, without greenneſs, flowers, or cattle; the air thick or heavy; the water frozen, with carts paſſing over it, and boys playing upon it, &c. 11. Laſtly, let every ſite have its proper *parerga*, adjuncts or additional graces, as the farm-houſe, wind-mill, water-mill, woods, flocks of ſheep, herds of cattle, pilgrims, ruins of temples, caſtles, and monuments, with a thouſand ſuch other things only proper to particular ſubjects.

LANDSPERG, the name of two towns in Germany; one ſituated on the river Warta, thirty-two miles north-eaſt of Frankfort upon the Oder; and the other, in Bavaria, twenty-three miles ſouth of Augſburg.

LANERK, a parliament-town of Scotland, ſituated on the river Clyde, twenty miles ſouth-eaſt of Glaſgow.

LANGEAC, a town of France, forty miles ſouth of Clermont.

LANGLAND, an iſland of Denmark, ſituated in the ſtreight called the Great Belt, between Zeland and Funen.

LANGREL SHOT, at ſea, that conſiſting of two bars of iron, joined by a chain or ſhackle, and having half a ball of iron fixed on each end; by means of which apparatus, it does great execution among the enemy's rigging.

LANGRES, a great city of Champaign, the biſhop of which is one of the twelve peers of France: eaſt long. 5° 22′, and north lat. 48°.

LANGUAGE, a ſet of words which any people have agreed upon, whereby to communicate their thoughts to each other. Buffier obſerves, that the firſt principles of all languages may be reduced to expreſſions, ſignifying, firſt, the ſubject ſpoken of; ſecondly, the thing affirmed of it; and thirdly, the circumſtances of the one and the other: but as each language has its peculiar ways of denoting each of theſe, a language is only to be looked on as an aſſemblage of expreſſions, which chance or caprice has eſtabliſhed among a certain people. Hence we find, that it is uſage and cuſtom that are the rules of a language; and theſe hold their empire independent of reaſon, or any other cauſe: nor has reaſon any thing to do in language, unleſs to ſtudy or teach it ſuch as it is: here then commences grammar, a juſt plan of which ſuppoſes a language already introduced by uſe, and without pretending to alter or amend a tittle, only furniſhes reflections called rules, to which the manners of ſpeaking uſed in that language may be reduced: this aſſemblage of reflections is what we call the grammar of that language. See the articles GRAMMAR and WORD.

It is chance then to which we owe uſage, and uſage that makes the rules and meaſures of a language. Uſage indeed is ſomewhat dubious, and may be divided into good and bad: the difference between the two being this, that the former is better eſtabliſhed or authorized than the latter; and the difference of authority is no more, in the dead languages, than the writings of the beſt authors in that language; thoſe being allowed the beſt authors in the language, who wrote when the ſtate was in its greateſt glory. Thus the age of Auguſtus being the moſt diſtinguiſhed period in the roman hiſtory, we call that good latin which is conformable to the manners of ſpeaking uſed by authors who wrote within fifty years before, or after the reign of that emperor. As to the living languages, the good uſage, or mode, is that which obtains amongſt the moſt eminent perſons, whether as to quality and authority, or as to learning, and the reputation of writing well.

There is found a conſtant reſemblance between the genius of each people, and the language they ſpeak. Thus the Greeks, a polite but voluptuous people, had a language perfectly ſuitable, full of delicacy and ſweetneſs. The Romans, who ſeemed only born to command, had a language noble, nervous, and auguſt; and their deſcendants, the Italians, are ſunk into ſoftneſs and effeminacy, which is as eaſily perceivable in their language, as in their manners. The language of the Spaniards is full of that haughtineſs which conſtitutes the diſtinguiſhing character of the people. The French, who have a world of vivacity, have a language that runs extremely briſk and lively. And the Engliſh who are naturally blunt, thoughtful, and of few words,

words, have a language exceeding ſhort, conciſe, and ſententious. See the articles GREEK, LATIN, ITALIAN, FRENCH, and ENGLISH.

The diverſity of languages is generally allowed to have taken its riſe from the confuſion at the tower of Babel, both by Jews, Chriſtians, and Mahometans; but the manner in which this diverſity was effected, is ſtill in diſpute among the learned.

As to the point of antiquity and priority among languages, that too has been extremely controverted. The Egyptians and Phrygians diſputed concerning the antiquity of their languages: the Arabs diſpute the point of antiquity with the Jews; but theſe, jealous even to exceſs of the honour of their nation, poſitively inſiſt that the hebrew tongue, ſuch as is found in the holy ſcriptures, is the primitive language, and that ſpoken by the firſt man; while others contend that the hebrew, chaldee, and arabic are only dialects of the original tongue. However that be, the arabic is held to be the moſt copious of all languages. See the articles CHALDEE, HEBREW, &c.

Languages are in general divided into original or mother tongues, as the hebrew and arabic in the eaſt, the teutonic and ſclavonic in the weſt. See the articles SCLAVONIA and TEUTONIC.

Languages are alſo diſtinguiſhed into dead or learned languages, and living languages; the former are thoſe only which ſubſiſt in books, and which muſt be learned by the rules of grammar, as the greek, hebrew, ſyriac, and chaldee; and the latter are thoſe ſtill ſpoken in ſome country or other, and which may be learned by converſation; the moſt noted among theſe are the french, italian, ſpaniſh, and engliſh.

LANGUED, in heraldry, expreſſes ſuch animals whoſe tongue appearing out of the mouth, is borne of a different colour from that of the body.

LANGUEDOC, a province of France, bounded by Lionois, on the north; by the river Rhone, which divides it from Dauphine and Provence, on the eaſt; by the Mediterranean and the Pyrenees, on the ſouth; and by Guienne and Gaſcony, on the weſt.

LANGUOR, among phyſicians, ſignifies great weakneſs and loſs of ſtrength, attended with a dejection of mind; ſo that the patients can ſcarce walk, or even ſtand upright, but are apt to faint away.

LANIERS, or LANNIERS. See LANNIERS.

LANIGEROUS, an appellation given to whatever bears wool. See WOOL.

Lanigerous trees are ſuch as bear a woolly or downy ſubſtance, as in the catkins of the willows, &c.

LANIUS, the BUTCHER-BIRD, in ornithology, a ſpecies of falcon, with black legs, a grey back, and a variegated belly. See the article FALCON.

This is the ſmalleſt of all the birds of prey, uſed by falconers; being ſcarce equal to the black bird in ſize.

LANNAR, or LANNERET, the blue-legged falcon, with oblong, black and white ſpots. It is a very beautiful bird, about the ſize of a common crow, very bold, and uſually kept for the diverſion of hawking. See the article HAWKING.

LANNIERS, or LANNIARDS, in a ſhip, are ſmall ropes reeved into the dead man's eyes of all ſhrowds, either to ſlacken them or to ſet them taught: the ſtays of all maſts are alſo ſet taught by lanniers.

LANTANA, in botany, a genus of the didynamia angioſpermia claſs of plants: the flower is monopetalous, with a plain and quinquifid limb: the fruit is a roundiſh unilocular drupe, which includes a bilocular nut, containing two oblong kernels.

LANTERLOO, or LOO, a game at cards, played ſeveral ways, whereof we ſhall only mention two.

The firſt way is this: lift for dealing, and the beſt put carries it: as many may play as the cards will permit; five being dealt to each, and then turning up trump. Now if three, four, five, or ſix play, they may lay out the threes, fours, fives, ſixes, and ſevens, to the intent they may not be quickly looed; or, if they would have the loos come faſt about, then they are to play with the whole pack.

Having dealt, ſet up five ſcores, or chalks. Then aſk every one, beginning with the eldeſt in hand, whether they will play, or paſs from the benefit of the game; and here it is to be obſerved, that the cards have the ſame values as in honours. You may play upon every card what ſum you pleaſe, from a penny to a pound; and if looed, that is, win never a trick, you muſt lay down to the ſtock ſo much for your five cards, as you played upon every one of them. Every deal rub off a ſcore, and for every trick you win ſet up a ſcore, till the firſt ſcores are out; then counting your ſcores, or the numbers of the tricks you have won, you are to take

take from the ſtock in proportion to the value. A flush, or five cards of a ſuit looes all the other hands, and ſweeps the board; and if there be two flushes, the eldeſt in hand hath the advantage: the knave of clubs, called paam, has this privilege, that he makes a ſuit with any other cards, and ſaves the perſon who has him from being looed.

The other way is this: the dealer lays down ſo much for every card, as the company pleaſe to play for; and the cards being dealt, all muſt play; if any be looed, they muſt each lay down ſo much as the cards are valued at, for their loo; and if the perſon next dealing be looed, he muſt lay down double the ſaid ſum, *viz.* one for dealing, and the other for his loo. In caſe of a loo, the gameſters are aſked, whether they will play, or not; beginning at the eldeſt hand; but if there is no loo, they muſt all play as at firſt; and this neceſſity, they juſtly call *force*.

If there be never a loo, the money may be divided by the gameſters, according to the number of their tricks, or left till one be looed, as they ſhall judge proper.

ANTERN, or LANTHORN, a device to carry a candle in; being a kind of cover uſually made of white iron, with laſhes of ſome tranſparent matter, as glaſs, horn, &c. to tranſmit the light.

ark LANTERN, one with only a ſingle opening, which may alſo be cloſed up when the light is to be entirely hid; or opened, when there is occaſion for the aſſiſtance of the light to diſcover ſome object.

aſt of LANTERNS, a chineſe feſtival obſerved on the fifteenth day of the firſt month, when every chineſe ſets out a large lantern, illuminated with a great number of wax-candles. Theſe lanterns are more or leſs ſplendid, in proportion to the circumſtances of the owner: ſome of them are valued at ten thouſand crowns, on account of the decorations beſtowed on them; theſe are from twenty to thirty feet diameter, and ſerve as a kind of halls, in which they make ſumptuous entertainments.

The chineſe aſcribe the riſe of this feſtival to an unhappy accident which happened in the family of a certain mandarin, whoſe daughter, as ſhe was walking one evening on the bank of a river, fell in and was drowned, on which her father, it is ſaid, went in ſearch of her with a great number of lanterns, and that the ceremony is annually kept up in remembrance of his daughter. Others aſcribe it to an extravagant project of one of their emperors, who ſhut himſelf up with his concubines in a magnificent palace, which he illuminated with a great number of ſplendid lanterns; when the chineſe, ſcandalized at his behaviour, demoliſhed his palace and hung the lanterns all over the city.

Magic LANTERN, an optic machine, whereby little painted images are repreſented ſo much magnified, as to be accounted the effect of magic by the ignorant.

The contrivance is briefly this: ABCD (plate CLII. fig. 4.) is a tin-lantern, from whoſe ſide there proceeds a ſquare tube *bnklmc*, conſiſting of two parts; the outermoſt of which *nklm* ſlides over the other, ſo as that the whole tube may be lengthened or ſhortened by that means. In the end of the arm *nklm*, is fixed a convex glaſs *kl*: about *de*, there is a contrivance for admitting and placing an object, *de*, painted in dilute and tranſparent colours, on a plane thin glaſs; which object is there to be placed inverted. This is uſually ſome ludicrous or frightful repreſentation, the more to divert the ſpectators: *bbc* is a deep convex glaſs, placed in the other end of the prominent tube, the only uſe of which is to caſt the light of the flame *a* ſtrongly on the picture *de*, painted on the plane thin glaſs. Hence, if the object *de* be placed farther from the glaſs *kl* than its focus, it is manifeſt that the diſtinct image of the object will be projected by the glaſs *kl*, on the oppoſite white wall FH, at *fg*; and that in an erect poſture: ſo that, in effect, this appearance of the magic lantern is the ſame with that of the camera obſcura, or darkened room; ſince here the chamber EFGH is ſuppoſed quite dark, excepting the light in the lantern ABCD. See CAMERA OBSCURA. And here we may obſerve, that if the tube *bnklmc* be contracted, and thereby the glaſs *kl* brought nearer the object *de*, the repreſentation *fg* ſhall be projected ſo much the larger, and ſo much the more diſtant from the glaſs *kl*; ſo that the ſmalleſt picture at *de* may be projected at *fg*, in any greater proportion required, within due limits: whence it is, that this lantern got the name of *lanterna megalographica*. On the other hand, protracting the tube will diminiſh the object. Inſtead of the convex glaſs to heighten the light, ſome prefer a concave ſpeculum, its focus being nearer than that of

a

words, have a language exceeding ſhort, conciſe, and ſententious. See the articles GREEK, LATIN, ITALIAN, FRENCH, and ENGLISH.

The diverſity of languages is generally allowed to have taken its riſe from the confuſion at the tower of Babel, both by Jews, Chriſtians, and Mahometans; but the manner in which this diverſity was effected, is ſtill in diſpute among the learned.

As to the point of antiquity and priority among languages, that too has been extremely controverted. The Egyptians and Phrygians diſputed concerning the antiquity of their languages: the Arabs diſpute the point of antiquity with the Jews; but theſe, jealous even to exceſs of the honour of their nation, poſitively inſiſt that the hebrew tongue, ſuch as is found in the holy ſcriptures, is the primitive language, and that ſpoken by the firſt man; while others contend that the hebrew, chaldee, and arabic are only dialects of the original tongue. However that be, the arabic is held to be the moſt copious of all languages. See the articles CHALDEE, HEBREW, &c.

Languages are in general divided into original or mother tongues, as the hebrew and arabic in the eaſt, the teutonic and ſclavonic in the weſt. See the articles SCLAVONIA and TEUTONIC.

Languages are alſo diſtinguiſhed into dead or learned languages, and living languages; the former are thoſe only which ſubſiſt in books, and which muſt be learned by the rules of grammar, as the greek, hebrew, ſyriac, and chaldee; and the latter are thoſe ſtill ſpoken in ſome country or other, and which may be learned by converſation; the moſt noted among theſe are the french, italian, ſpaniſh, and engliſh.

LANGUED, in heraldry, expreſſes ſuch animals whoſe tongue appearing out of the mouth, is borne of a different colour from that of the body.

LANGUEDOC, a province of France, bounded by Lionois, on the north; by the river Rhone, which divides it from Dauphine and Provence, on the eaſt; by the Mediterranean and the Pyrenees, on the ſouth; and by Guienne and Gaſcony, on the weſt.

LANGUOR, among phyſicians, ſignifies great weakneſs and loſs of ſtrength, attended with a dejection of mind; ſo that the patients can ſcarce walk, or even ſtand upright, but are apt to faint away.

LANIERS, or LANNIERS. See LANNIERS.

LANIGEROUS, an appellation given to whatever bears wool. See WOOL.

Lanigerous trees are ſuch as bear a woolly or downy ſubſtance, as in the catkins of the willows, &c.

LANIUS, the BUTCHER-BIRD, in ornithology, a ſpecies of falcon, with black legs, a grey back, and a variegated belly. See the article FALCON.

This is the ſmalleſt of all the birds of prey, uſed by falconers; being ſcarce equal to the black bird in ſize.

LANNAR, or LANNERET, the blue-legged falcon, with oblong, black and white ſpots. It is a very beautiful bird, about the ſize of a common crow, very bold, and uſually kept for the diverſion of hawking. See the article HAWKING.

LANNIERS, or LANNIARDS, in a ſhip, are ſmall ropes reeved into the dead man's eyes of all ſhrowds, either to ſlacken them or to ſet them taught: the ſtays of all maſts are alſo ſet taught by lanniers.

LANTANA, in botany, a genus of the didynamia angioſpermia claſs of plants: the flower is monopetalous, with a plain and quinquifid limb: the fruit is a roundiſh unilocular drupe, which includes a bilocular nut, containing two oblong kernels.

LANTERLOO, or LOO, a game at cards, played ſeveral ways, whereof we ſhall only mention two.

The firſt way is this: lift for dealing, and the beſt put carries it: as many may play as the cards will permit; five being dealt to each, and then turning up trump. Now if three, four, five, or ſix play, they may lay out the threes, fours, fives, ſixes, and ſevens, to the intent they may not be quickly looed; or, if they would have the loos come faſt about, then they are to play with the whole pack.

Having dealt, ſet up five ſcores, or chalks. Then aſk every one, beginning with the eldeſt in hand, whether they will play, or paſs from the benefit of the game; and here it is to be obſerved, that the cards have the ſame values as in honours. You may play upon every card what ſum you pleaſe, from a penny to a pound; and if looed, that is, win never a trick, you muſt lay down to the ſtock ſo much for your five cards, as you played upon every one of them. Every deal rub off a ſcore, and for every trick you win ſet up a ſcore, till the firſt ſcores are out; then counting your ſcores, or the numbers of the tricks you have won, you are to take

take from the ſtock in proportion to the value. A flush, or five cards of a ſuit looes all the other hands, and ſweeps the board; and if there be two flushes, the eldeſt in hand hath the advantage: the knave of clubs, called paam, has this privilege, that he makes a ſuit with any other cards, and ſaves the perſon who has him from being looed.

The other way is this: the dealer lays down ſo much for every card, as the company pleaſe to play for; and the cards being dealt, all muſt play; if any be looed, they muſt each lay down ſo much as the cards are valued at, for their loo; and if the perſon next dealing be looed, he muſt lay down double the ſaid ſum, *viz.* one for dealing, and the other for his loo. In caſe of a loo, the gameſters are aſked, whether they will play, or not; beginning at the eldeſt hand; but if there is no loo, they muſt all play as at firſt; and this neceſſity, they juſtly call *force*.

If there be never a loo, the money may be divided by the gameſters, according to the number of their tricks, or left till one be looed, as they ſhall judge proper.

ANTERN, or LANTHORN, a device to carry a candle in; being a kind of cover uſually made of white iron, with laſhes of ſome tranſparent matter, as glaſs, horn, &c. to tranſmit the light.

ark LANTERN, one with only a ſingle opening, which may alſo be cloſed up when the light is to be entirely hid; or opened, when there is occaſion for the aſſiſtance of the light to diſcover ſome object.

aſt of LANTERNS, a chineſe feſtival obſerved on the fifteenth day of the firſt month, when every chineſe ſets out a large lantern, illuminated with a great number of wax-candles. Theſe lanterns are more or leſs ſplendid, in proportion to the circumſtances of the owner: ſome of them are valued at ten thouſand crowns, on account of the decorations beſtowed on them; theſe are from twenty to thirty feet diameter, and ſerve as a kind of halls, in which they make ſumptuous entertainments.

The chineſe aſcribe the riſe of this feſtival to an unhappy accident which happened in the family of a certain mandarin, whoſe daughter, as ſhe was walking one evening on the bank of a river, fell in and was drowned, on which her father, it is ſaid, went in ſearch of her with a great number of lanterns, and that the ceremony is annually kept up in remembrance of his daughter. Others aſcribe it to an extravagant project of one of their emperors, who ſhut himſelf up with his concubines in a magnificent palace, which he illuminated with a great number of ſplendid lanterns; when the chineſe, ſcandalized at his behaviour, demoliſhed his palace and hung the lanterns all over the city.

Magic LANTERN, an optic machine, whereby little painted images are repreſented ſo much magnified, as to be accounted the effect of magic by the ignorant.

The contrivance is briefly this: ABCD (plate CLII. fig. 4.) is a tin-lantern, from whoſe ſide there proceeds a ſquare tube *b n k l m c*, conſiſting of two parts; the outermoſt of which *n k l m* ſlides over the other, ſo as that the whole tube may be lengthened or ſhortened by that means. In the end of the arm *n k l m*, is fixed a convex glaſs *k l*: about *d e*, there is a contrivance for admitting and placing an object, *d e*, painted in dilute and tranſparent colours, on a plane thin glaſs; which object is there to be placed inverted. This is uſually ſome ludicrous or frightful repreſentation, the more to divert the ſpectators: *b b c* is a deep convex glaſs, placed in the other end of the prominent tube, the only uſe of which is to caſt the light of the flame *a* ſtrongly on the picture *d e*, painted on the plane thin glaſs. Hence, if the object *d e* be placed farther from the glaſs *k l* than its focus, it is manifeſt that the diſtinct image of the object will be projected by the glaſs *k l*, on the oppoſite white wall F H, at *f g*; and that in an erect poſture: ſo that, in effect, this appearance of the magic lantern is the ſame with that of the camera obſcura, or darkened room; ſince here the chamber E F G H is ſuppoſed quite dark, excepting the light in the lantern A B C D. See CAMERA OBSCURA.

And here we may obſerve, that if the tube *b n k l m c* be contracted, and thereby the glaſs *k l* brought nearer the object *d e*, the repreſentation *f g* ſhall be projected ſo much the larger, and ſo much the more diſtant from the glaſs *k l*; ſo that the ſmalleſt picture at *d e* may be projected at *f g*, in any greater proportion required, within due limits: whence it is, that this lantern got the name of *lanterna megalographica*. On the other hand, protracting the tube will diminiſh the object. Inſtead of the convex glaſs to heighten the light, ſome prefer a concave ſpeculum, its focus being nearer than that of

a

a lens; and in this focus, they place the candle.

LANTERN, in architecture, a little dome raiſed over the roof of a building, to give light, and ſerve as a crowning to the fabric.

The term lantern is alſo uſed for a ſquare cage of carpentry, placed over the ridge of a corridor, or gallery, between two rows of ſhops, to illumine them; like that of the Royal Exchange of London.

LANTERNISTS, a denomination aſſumed by the academicians of Tholouſe.

LANUGO, the ſoft down of plants, like that growing on the fruit of the peach-tree; whence ſuch plants are termed lanuginous.

LANZO, a town of Italy, in the territory of Piedmont, ſituated fifteen miles north of Turin.

LAODICEA, an antient city of the leſſer Aſia, ſituated eaſt of Epheſus, now in ruins.

LAON, a city of France, in the province of the Iſle of France, ſituated in eaſt long. 3° 45′, lat. 49° 37′.

LAOS, a country of the farther India in Aſia, bounded by China on the north; by Tonquin, on the eaſt; by Siam and Cambodia, on the ſouth; and by Ava and Pegu, on the weſt.

LAOTUNG, or LEAOTUNG, See the article LEAOTUNG.

LAPATHUM, the DOCK, in botany, is made by Linnæus, one genus with ſorrel, and deſcribed under the name rumex. See the article RUMEX.

The oxylapathum-root is chiefly uſed externally for the itch, and other cutaneous foulneſſes, made into an ointment with lard. Internally, it makes an excellent ingredient in diet-drinks and decoctions, intended againſt the ſcurvy, and all other diſeaſes of the ſkin: for beſides its aperient and attenuant quality, it is poſſeſſed of an aſtringency that renders it very valuable, whereby, after diſlodging the viſcid humours, it reſtores the tone of the parts.

LAPIDARY, an artificer, who cuts precious ſtones. See the article GEM.

The art of cutting precious ſtones is of great antiquity. The French, tho' they fell into it but lately, have notwithſtanding carried this art to a very great perfection, but not in any degree ſuperior to the Engliſh.

There are various machines employed in the cutting of precious ſtones, according to their quality: the diamond, which is extremely hard, is cut on a wheel of ſoft ſteel, turned by a mill, with diamond-duſt, tempered with olive-oil, which alſo ſerves to poliſh it.

The deſcription of the diamond-cutters wheel or mill, as repreſented in plate CLII. fig. 5. is as follows: *a* is the pincers; *b*, the ſcrew of the pincers; *c*, the ſhell that carries the maſtic and the diamond; *d*, the maſtic that ſoftens the diamond at the end of the ſhell; *e*, the diamond preſented to the wheel, to be cut facetwiſe; *f*, the iron-wheel turning on its pivot; *g*, iron-pegs, to fix and keep the pincers ſteady; *h*, ſmall pigs of lead of different weights, wherewith the pincers are loaded at pleaſure to keep them ſteady; *i*, a wooden wheel; *k*, the axe of the wheel. It is bended and makes an elbow under the wheel, to receive the impulſion of a bar that does the office of a turning handle; *l*, the ſole or ſquare piece of ſteel, wherein the pivot of the tree or axis moves; *m*, the turning handle, that ſets the wheel a-going by means of the elbow of its axis. The elbow of the piercer wherewith a hogſhead is broached, will give an idea of this kind of motion; *n*, the catgut-ſtring, that goes round both the iron and the wooden wheels. If the wooden wheel is twenty times larger than the iron-one, the latter ſhall make twenty turns upon the diamond, whilſt the large wheel makes but one round its axis; and whilſt the boy gives, without any reſiſtance, a hundred impulſions to the turning handle, the diamond experiences a thouſand times the friction of the whole grinding wheel.

The diamond-cutter follows the work with his eyes, without taking any other ſhare in it than that of changing the place of the diamond to bite on a new ſurface; and of timely throwing upon it, with a few drops of oil, the minute particles of the diamond's firſt ground one againſt the other, to begin the cutting of them.

The oriental ruby, ſapphire, and topaz, are cut on a copper-wheel with diamond-duſt, tempered with olive-oil, and are poliſhed on another copper wheel with tripoli and water. The hyacinth, emerald, amethyſt, garnets, agates, and other ſtones, not of an equal degree of hardneſs with the other, are cut on a leaden wheel with ſmalt and water, and poliſhed on a tin-wheel with tripoli. The turquois of the old and new rock, giraſol and opal, are cut and poliſhed on a wooden wheel with tripoli alſo.

The lapidaries of Paris have been a corporation

BRITISH MUSEUM

Fig. 1. LABEL.

Fig. 2. Rolling LAMP.

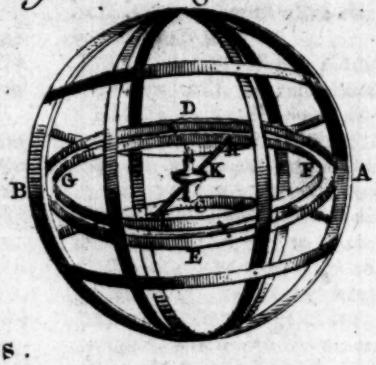


Fig. 3. LANCETS.

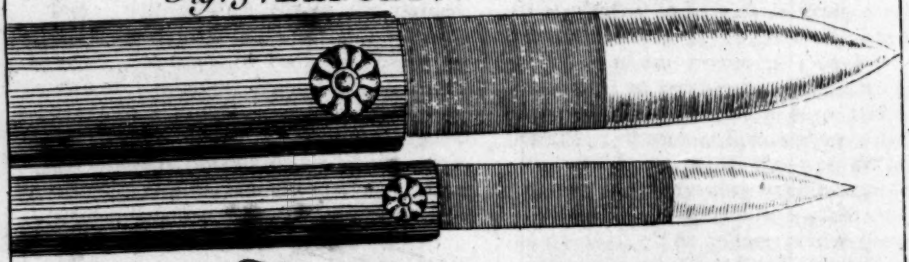


Fig. 4. MAGIC LANTHORN.

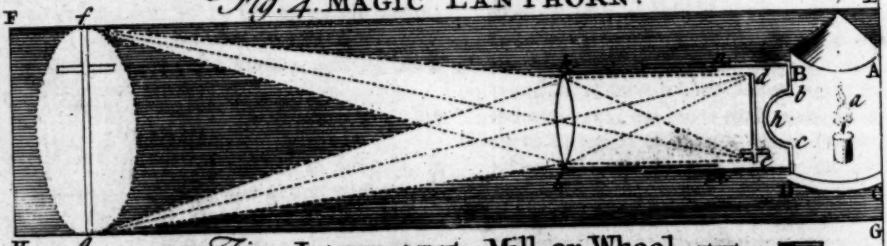


Fig. 5. LAPIDARY's Mill or Wheel.

I. Jeffrys sculp

portation ſince the year 1290. It is governed by four jurats, who ſuperintend their rights and privileges; viſit the maſter-workmen, take care of the maſter-piece of workmanſhip, bind apprentices, and adminiſter the freedom.

LAPIDARY is alſo uſed for a virtuoſo ſkilled in the nature, kinds, &c. of precious ſtones, or a merchant who deals in them.

LAPIDARY-STYLE denotes the ſtyle proper for monumental or other inſcriptions; being a ſort of medium between proſe and verſe. The jejune and brilliant are here equally to be avoided. Cicero has preſcribed the rules of this ſtyle. "Accedat, "oportet oratio varia, vehemens, plena "ſpiritûs. Omnium ſententiarum gravi-"tate, omnium verborum ponderibus, "eſt utendum."

The lapidary-ſtyle, which was loſt with the antient monuments, has been retrieved at the beginning of this age by count Emanuel Teſoro. It is now uſed various ways, at the beginning of books; and even epiſtles dedicatory are compoſed in it, whereof we have no example among the antients. For an example of the manner of it among the greeks, ſee the article EPITAPH.

LAPIDESCENT, ſomething that petrifies, or turns to ſtone. See the article STONE.

The waters of many ſprings are impregnated with lapideſcent particles of ſpar, wherewith bodies immerſed in them being cruſted over, are ſaid to be petrified. See the article PETRIFACTION.

LAPIS, in general, is uſed to denote a ſtone of any kind. See STONE.

But beſides this, its moſt common acceptation, the term lapis is applied by phyſicians, ſurgeons, and chymiſts, to ſeveral other ſubſtances, as well as different kinds of ſtone. 1. The lapis armenus, an ochre of copper, of a deep blue colour, is a violent emetic, the doſe being from five to ten grains: it is one of the fineſt blues that nature furniſhes for painting, and in oil makes a colour that will ſtand without alteration, almoſt as well as true ultra marine. The blue ochre of the ſhops, improperly called lapis armenus, is only a ſoft and friable earth. 2. Lapis bezoardicus foſſilis, or foſſile bezoar, is only the rough purple geodes, which contains in it a fine earth, ſaid to be a very powerful ſudorific, and a ſlight aſtringent. It is given in the ſmall-pox and meaſles, and againſt the bites of venomous animals; the uſual doſe being from five grains to a ſcruple.

3. Lapis calaminaris. See CALAMINARIS.
4. Lapis divinus. See DIVINE STONE.
5. Lapis galactites. See GALACTITES.
6. Lapis hæmatites. See HÆMATITES.
7. Lapis hibernicus, iriſh ſlate; a ſlate ſtrongly impregnated with alum, and often containing a portion of vitriol; of a ſoft and more friable texture than any of the other ſtones of that claſs; of a duſkiſh colour, and remarkably heavy. It is given in powder as a ſtyptic in all kinds of hæmorrhages, with ſucceſs. 8. Lapis infernalis, the Lunar cauſtic, a preparation uſually made from an evaporated ſolution of ſilver, but much better made from the cryſtals of ſilver in the following eaſy manner. See CRYSTAL. Put the cryſtals of ſilver into a clean glaſs-veſſel, ſet it over burning charcoal, and let the cryſtals melt: when no more ſmoke ariſes from the melted matter, pour it out of the glaſs into little cylindric cavities, formed in clay, or into any thing elſe that will give it an oblong form. As ſoon as the matter is cold, take it out of the mould, wrap it in ſome warmed paper, and dry it thoroughly in it; then wipe the ſurface, and put it into a clean and dry bottle, and cork it well up. It will keep thus many years. It is a very powerful cauſtic, eating away the fleſh, and even the bones it is applied to, only moiſtening the end of it firſt. 9. Lapis judaicus. See JEW'S STONE. 10. Lapis lazuli. See LAZULI. 11. Lapis melitites of the antients, an indurated clay, very heavy, of a pale white colour, with a faint caſt of greyiſhneſs in it, variegated with ſpots, clouds, and veins of a pale yellow. It was antiently uſed in Egypt and Ethiopia: at preſent it is often met with in the german mines, and in the beds of ſeveral rivers both in France and Italy. The antients eſteemed it as a vulnerary and narcotic. They ground it down into a thick liquor with water, and waſhed ulcers with it. They alſo gave it internally to people who were to ſuffer operations in ſurgery, in order to prevent their feeling the pain. At preſent it is little known in the world, and is uſed for no better purpoſe than that of marking in the manner of chalk. 12. Lapis morochthus of the antients, now called french chalk, is much the ſame kind with the former indurated clay, but more fine; being extremely denſe, ſmooth, and gloſſy, when rubbed: the antients had it as well as the former from Egypt and Ethiopia,

Ethiopia, but the world is now ſupplied with it from France, where it is in great abundance: the antients eſteemed it an aſtringent and lithontriptic: they alſo uſed a collyrium made of it in diſorders of the eyes and eye-lids: however, at preſent we know nothing of it, but that it ſeems to take ſpots out of clothes better than fullers-earth, and that it marks better than chalk. 13. Lapis nephriticus, nephritic ſtone, a ſpecies of jaſper. See JASPER. It is found on the ſurface of the earth, and in the beds of rivers in many parts of America; it is pretended to have prodigious virtues as a diuretic, and to exert them in their full force on being worn externally. The Indians wear it alſo as a gem cut into various forms, and hung to their lips. 14. Lapis ſelenites, or moon-ſtone; that ſpecies of the ſelenites uſed in medicine is the common thin pellucid rhomboidal kind. See SELENITÆ. This is a beautiful foſſil, perfectly pure from any extraneous mixtures, of a regular and determinate figure like that of the cryſtals of blue vitriol: it is of various ſizes, from one tenth of an inch in diameter, to ſix or more inches. It is found in ſtrata of clay, uſually of the blue tough kind. It is a powerful aſtringent, and is of great effect in diarrhœas, dyſenteries, and hæmorrhages of all kinds. It is not much known in the ſhops, tho' it ſtands in moſt books on the materia medica. 15. Lapis ſpecularis, muſcovy-talc, or iſinglaſs, a foſſil well known for its many uſes, though the principal of theſe are not of the medicinal kind: it is one of the pureſt and ſimpleſt of the natural bodies, and more than almoſt any thing that we know reſiſts the force of menſtruums, and even of fire. It is compoſed of a multitude of extremely thin pellucid and beautiful plates, or flakes of great extent, each uſually making the whole ſurface of the maſs. It is found in great abundance in Muſcovy and Perſia, and in many mountains in Germany. There are ſome who recommend it in powder for epilepſies. It is uſed in many of the arts and manufactures: the antients made their windows of it inſtead of glaſs: at preſent our miniature-painters ſometimes uſe it before their pictures inſtead of glaſs: it is alſo often uſed inſtead of horn for lanterns; and the minute bodies intended for microſcopic obſervation are preſerved between plates of it. 16. Lapis thyites of Dioſcorides, is an elegant and beautiful ſubſtance of the nature of thoſe bodies already mentioned, under the name of lapis melitites, and lapis morochthus; the antients uſed it in diſtemperatures of the eyes, as they did the melitites.

LAPIS AMPELITES. See AMPELITES.

LAPIS OBSIDIANUS, or the obſidian ſtone, or chian marble, of the antients, the dull, ſmooth, hard, black marble. See the article MARBLE.

LAPLAND, the moſt northerly part of Europe, divided into Norwegian Lapland, Swediſh Lapland, and Ruſſian Lapland: it lies between 10 and 35° of eaſt long. and between 65 and 72° of north lat.

LAPSA, denotes a patron's neglect or omiſſion to preſent to a church within ſix months after it becomes vacant. When after a vacancy the patron does not preſent in ſix months, the ordinary has the next ſix months to collate to the benefice; and if he does not preſent within that time, the metropolitan has farther ſix months to do it in; and if he ſhould fail in doing it in his time, the next ſix months devolves to the crown.

LAPSANA, STELLATED HAWK-WEED, in botany, a plant of the ſyngeneſia-polygamia-æqualis claſs, the compound flower of which is imbricated with about ſixteen equal and uniform hermaphrodite corollulæ; the partial corolla is monopetalous, ligulated, truncated, and quinquedentated; there is no pericarpium; the ſeed is ſingle, oblong, and cylindrically trigonal; the receptacle is naked and plain.

This genus comprehends the lampſana, hedypnois, zacintha, and rhagadiolus or rhagadioloides of authors. In the lampſana the ſeeds are all naked, not ſurrounded by the ſquamæ of the cup. In the rhagadiolus, every ſquama of the cup incloſes a ſingle ſeed. In the zacintha, the marginal ſeeds are each ſurrounded by a ſquama of the cup, and the central ones are coronated with a ſhort ſimple down. In the hedypnois the marginal ſeeds are each ſurrounded in a ſquama of the cup, and the central ones are coronated with a cup divided into five denticles.

LAPWING, *vanellus*, in ornithology. See the article VANELLUS.

LAQUEUS, in ſurgery, a kind of ligature ſo contrived, that when ſtretched by any weight, or the like, it draws up cloſe. Its uſe is to extend broken or diſjointed bones,

bones, to keep them in their places when they are ſet, and to bind the parts cloſe together. See EXTENSION, &c.

LAR, in geography, a city of Perſia, in the province of Fars, ſituated 360 miles ſouth eaſt of Iſpahan, in eaſt long 54° north lat. 28° 15′.

LAR-BOARD, among ſeamen, the left hand ſide of the ſhip, when you ſtand with your face towards the head.

LARCENY, in law, a felonious carrying away another perſon's goods; and this according to the value of the thing ſtolen, is either grand, or petit larceny; the firſt being ſtealing effects above the value of 1 s. and the laſt ſuch as are either of that value, or under it: but where two perſons together ſteal goods to the value of only 13 d. it is grand larceny in both: and if one perſon at different times ſteal ſeveral different things from the ſame perſon, which amount upon the whole to above 12 d. value, they may be joined in one indictment, and the offender found guilty of grand larceny; but this is very ſeldom practiſed; on the contrary, the jury, where the theft appears to be the firſt offence, frequently bring in their verdict, as they lawfully may, that the things are not above 10 d. value, and by that means reduce the offence to petit larceny, though the offender may perhaps be indicted for ſtealing to the value of 30 or 40 s. and upwards. The crime of grand larceny is puniſhable with death, and that of petit larceny, only with the corporal puniſhment of whipping, &c.

Larceny has been alſo divided into ſimple larceny by taking away the goods of another; mixed, or complicated larceny, which has a further degree of guilt, as in caſes of robbery, &c. private larceny, where the felonious taking from a perſon above the value of 12 d. is felony without benefit of clergy, if it be only laid in the indictment that it was done privately and ſecretly. And laſtly, open larceny, or ſuch as is committed with the party's knowledge, as where a thief ſnatches off a perſon's hat, and runs away with it; this is within the benefit of the clergy. A perſon may commit larceny, by taking away his own goods in the hands of another; as where the owner delivers goods to a carrier, or any other perſon, and afterwards ſecretly ſteals them, with an intent to charge him for them. If a perſon employs a child of ſix or ſeven years of age to take goods and bring them to him, and he carries them away, the child is not guilty of this crime on account of his infancy, but it is larceny in the other.

LAREDO, a port town of Spain, in the province of Biſcay, ſituated on the coaſt of Biſcay: weſt lon. 3° 40′, north lat. 43° 30′.

LARES, certain inferior deities among the antient Romans, who were the guardians of houſes; they were alſo ſometimes taken for the guardians of ſtreets and ways, and Tibullus makes them the guardians of the fields. According to Ovid, they were the ſons of Mercury and Lara, whoſe tongue was cut out by Jupiter, becauſe ſhe revealed his adulteries to Juno; and not contented with this, he delivered her to Mercury, with orders to conduct her to hell; but he falling in love with her by the way, had twins by her, who from their mother were called lares.

Theſe domeſtic deities were ſometimes repreſented under the figure of a dog, the ſymbol of fidelity; becauſe dogs have the ſame function as the lares, which is to guard the houſe. At other times their images were covered with the ſkin of a dog, and had the figure of that domeſtic animal ſtanding by them. The principal ſacrifices to the lares, were incenſe, fruit, and a hog.

The Romans had a private place in their houſes, called lararium, in which, among other ſtatues of their gods, were their lares, and the images of their anceſtors. Tertullian tells us, that the cuſtom of worſhipping the lares aroſe from their antiently interring their dead in their houſes; whence the credulous people took occaſion to imagine, that their ſouls continued there likewiſe, and thence proceeded to pay them divine honours. To which may be added, that the cuſtom of burying them in the highways might occaſion their being conſidered likewiſe as gods of the highways.

LARGE, in the manege, a horſe is ſaid to go large and wide, when he takes in a great deal of ground, by going wide of the center of the volt, and deſcribing a great circumference.

LARGO, in the italian muſic, a ſlow movement, one degree quicker than the grave, and two than the adagio. See the articles ADAGIO and GRAVE.

LARINA, a town of Italy, in the kingdom of Naples, and province of Moliſe: eaſt long. 15° 45′, north lat. 41° 50′.

LARISSA, a city of european Turky in the province of Theſſaly, ſituated on the river Peneus: eaſt long. 23° 30′, north lat. 39°.

LARIX, the LARCH-TREE, a ſpecies of Pinus. See the article PINUS.

LARK, *alauda*, in ornithology. See the article ALAUDA.

To this genus belong, 1. The ſky-lark, with the long wing feathers, variegated with white and brown. 2. The tit-lark, with a white line over the eyes. 3. The wood-lark, with the wings obliquely variegated with white. 4. The yellow-breaſted lark. 5. The ſnow-bird, or pied chaffinch, with the tail-feathers black, except the three lateral ones, which are white.

Sea-LARK, the engliſh name of a ſpecies of charadrius, with a black front and a white line on it. See CHARADRIUS.

LARK-SPUR, *delphinium*, in botany. See the article DELPHINIUM.

LARMIER, in architecture, a flat, ſquare, maſſive member of the corniche, between the cymatium and ovolo, and jetting out fartheſt; it is ſo called from its uſe, which is to diſperſe the water, and cauſe it to fall at a diſtance from the wall, drop by drop, or as it were by tears; *larme*, in french, ſignifying a tear. It is otherwiſe called corona. See CORNICHE.

LARTA, a port-town of european Turky, in the province of Epirus or Janna, ſituated at the entrance of the gulph of Venice: eaſt long. 21° 15′, north lat. 39°.

LARUS, the GULL, in ornithology, a genus of the anſeres-order of birds, thus characterized: the beak is ſtraight all the way, except juſt at the point, where it turns down; add to this, that it is obtuſe, not denticulated along the ſides, and its lower chap gibbous or protuberant underneath.

To this genus belong, 1. The white gull with a hoary back, about the ſize of a well-grown pullet. 2. The great grey gull, or white larus with a greyiſh-brown back, and ſomewhat larger than the firſt ſpecies. 3. The leſs gull, or ſea-mall with a grey back and ſpotted neck, about the ſize of a common tame pigeon. 4. The browniſh-grey ſea-mall, as large as the firſt ſpecies. 5. The torrock, or larus with a white head and a black ſpot on each ſide. 6. The peewit or black cap, ſo called from its black head; it is about the ſize of the third ſpecies. With ſeveral other ſpecies, diſtinguiſhed in the ſame manner.

LARYNGOTOMY, or BRONCHOTOMY. See the article BRONCHOTOMY.

LARYNX, the thick upper part of the aſpera arteria, or wind-pipe. The larynx is principally compoſed of five cartilages: the firſt is the thyroide or ſcutiform cartilage, which is of a kind of quadrangular figure, and ſtands in the anterior part; this is the largeſt of the five: the ſecond is the cricoide or annular one; this occupies the loweſt part, by way of baſe to the reſt; and to the loweſt part of this, what is properly called the aſpera arteria adheres: the third and fourth are the two arytænoide ones; theſe form, as it were, a kind of baſon of a ſingular figure, which is joined to the poſterior and ſuperior parts of the cricoides, by peculiar articulations on each ſide, that the glottis may be more eaſily opened and contracted: the fifth is the epiglottis. See GLOTTIS, EPIGLOTTIS, &c. The membrane which inveſts the larynx, is very ſenſible, and is furniſhed with a number of oſcula or openings, which diſcharge a lubricating fluid. There are alſo glands extended over each ſurface of it, which ſerve for ſecreting a mucous fluid, for lubricating the whole aſpera arteria. The ventricles of the larynx are certain hollows, ſome of them ſmaller and ſome larger; they are on the inſide of it, under the glottis, and ſerve to modulate the voice.

LASERPITIUM, LASER-WORT, a genus of the pentandria-digynia claſs of plants, the general corolla whereof is uniform; the partial one conſiſts of five nearly equal petals, inflexo-cordated at the ends; there is no pericarpium; the fruit is oblong and ſeparable into two parts, and is ridged with eight longitudinal membranes; the ſeeds are two, very large, oblong, and ſemi-cylindric, plane on the one ſide, but on the other ornamented on the back and edges with four membranes.

The root of laſſer-wort is ſaid to be good in the ſciatica, and for healing ſtrumæ and other excreſcences.

LASH, or LACE, in the ſea-language, ſignifies to bind and make faſt; as, to laſh the bonnet to the courſe, or the drabler to the bonnets: alſo the carpenter takes care that the ſpare yards be laſhed faſt to the ſhip's ſide; and in a rolling ſea, the gunners mind that the guns be well laſhed, leſt they ſhould break looſe. Laſhers are properly thoſe ropes which bind faſt the tackles and the breechings of the ordnance, when haled or made faſt within-board.

LASKETS, ſmall lines, like loops, ſewed to the bonnets and drablers of a ſhip, to laſh

laſh or lace the bonnets to the courſes, or the drablers to the bonnets.

LASKING, at ſea, is much the ſame with going large, or veering, that is going with a quarterly wind. See VEER.

LASSITUDE, or WEARINESS, κοπος, in medicine, a morbid ſenſation, that comes on ſpontaneouſly, without any previous motion, exerciſe, or labour. This is a frequent ſymptom in acute diſtempers: it ariſes either from an increaſe of bulk, a diminution of proper evacuation, or too great a conſumption of the fluids neceſſary to maintain the ſpring of the ſolids, or from a vitiated ſecretion of that juice.

The remedy in the firſt caſe is evacuations; and in the other a proper diet, or ſuch alterative medicines as influence ſuch a ſecretion. See the articles EVACUATION and SECRETION.

LAST, in general, ſignifies the burden or load of a ſhip.

It ſignifies alſo a certain meaſure of fiſh, corn, wool, leather, &c. A laſt of cod-fiſh, white herrings, meal, and aſhes for ſoap, is twelve barrels; of corn or rape-ſeed, ten quarters; of gun-powder, twenty-four barrels; of red-herrings, twenty cades; of hides, twelve dozen; of leather, twenty dickers; of pitch and tar, fourteen barrels; of wool, twelve ſacks; of ſtock-fiſh, one thouſand; of flax or feathers, 1700 lb.

LAST, in the marſhes of Kent, is applied to a court held by the twenty-four jurats, in which orders are given for the impoſing and levying of taxes, for preſerving the ſaid marſhes.

LAST-HEIR, in law, he to whom lands come by eſcheat, for want of lawful heirs; who, in many caſes, is the lord whereof they are held, but in others the king.

LASTAGE, or LESTAGE, as defined by Raſtal, a duty exacted in ſome fairs and markets, for carrying things bought, whither one will; but, according to another author, it is the cuſtom paid for wares ſold by the laſt. It ſignifies alſo the ballaſt or lading of a ſhip; and ſometimes is uſed for garbage, rubbiſh, or ſuch like filth.

LATEN, or LATTEN. See LATTEN.

LATERAL EQUATION, in algebra, a ſimple equation, whoſe root is only in one dimenſion. See EQUATION.

LATERAN COUNCILS, thoſe councils held in the baſilica of the Latin church at Rome. See the article COUNCIL.

There have been five councils held in this place, *viz.* in the years 1123, 1139, 1179, 1215, and 1513.

Canons regular of the congregation of the LATERAN, were introduced in the time of pope Leo I. and continued in the church till the reign of Boniface, who diſplaced them, and put ſecular canons in their room; but one hundred and fifty years after, the regulars were reinſtated again.

A LATERE, a term uſed to denote the qualifications of cardinals whom the pope ſends as legates into foreign courts, who are called legates a latere, as being his holineſs's aſſiſtants and counſellors in ordinary; theſe are the moſt conſiderable of the three other legates, being ſuch as the pope commiſſions to take his place in councils, and ſo called in regard that he never gives this office to any but his favourites and confidants, who are always *a latere*, at his ſide. A legate a latere has the power of conferring benefices without a mandate, of legitimating baſtards, to hold offices, and has a croſs carried before him, as the enſign of his authority.

De LATERE, legates who are not cardinals, but yet are entruſted with an apoſtolical legation. See the article LEGATE.

LATH, in building, a long, thin and narrow ſlip of wood, nailed to the rafters of a roof or ceiling, in order to ſuſtain the covering.

Theſe are diſtinguiſhed into three kinds, according to the different kinds of wood of which they are made, *viz.* heart of oak, ſap-laths, and deal laths; of which the two laſt are uſed for ceilings and partitions, and the firſt for tiling only. Laths are alſo diſtinguiſhed according to their length, into five-feet, four-feet, and three-feet-laths, though the ſtatute allows but of two lengths, thoſe of five, and thoſe of three feet, each of which ought to be an inch and a half in breadth, and half an inch in thickneſs, but they are commonly leſs.

Of cleaving LATHS. The lath-cleavers having cut their timbers into lengths, they cleave each piece with wedges, into eight, twelve, or ſixteen, according to the ſize of their timber; theſe pieces are called bolts: this is done by the felt-grain, which is that grain which is ſeen to run round in rings at the end of a piece of a tree. Thus they are cut out for the breadth of the laths, and this work is called felting. Afterwards they cleave the laths into their proper thickneſſes with their

their chit, by the quarter-grain, which is that which runs in ſtraight lines towards the pith. See the article GRAIN.

LATH BRICKS, bricks much longer than ordinary, uſed inſtead of laths, for drying malt; for which purpoſe they are extremely proper, as not being liable to catch fire, and retaining the heat much longer than thoſe of wood; ſo that a very ſmall fire will ſerve, after they are once heated. See BRICK and MALT.

LATHE, in turning, is an engine uſed in turning wood, ivory, and other materials. See plate CLIII. fig. 1. n° 1. It is compoſed of two legs or ſtyles, *a a*, which are commonly about two feet ten inches high, on the upper part of which are faſtened two pieces of wood called cheeks, *b*, *b*, parallel to the horizon; between theſe are two pieces of wood, called puppets, *c*, *c*, made to ſlide between the cheeks, and to be fixed down at any point at pleaſure; near the upper end of one of theſe puppets is faſtened a ſtrong ſpike of tempered ſteel, *d*, and oppoſite to it, in the other, is an iron-ſcrew *f*; by theſe the piece to be turned is ſuſtained, and is turned round by means of the ſtring *m*, put round it, and faſtened above to the pliable pole *l*, and underneath to the treddle or board, *i*, moved with the foot: there is alſo a piece of wood between the cheeks, called a reſt, *e*, whoſe office is to reſt the tool upon, that it may lie in a ſteady poſition while the workman uſes it.

When turners perform heavy work (which the pole and treddle will not command) they uſe inſtead of theſe a wheel (*ibid.* n° 2.) which is turned about ſometimes with one, and ſometimes with two handles, according to the weight of the work; its ſtring hath both its ends neatly faſtened together, and this being fixed in a groove round the edge of the wheel, and after being croſſed, put round a groove in the work, it is eaſily turned round with a ſwift and regular motion. This is the moſt expeditious method of working; for the ſpringing up of the pole makes an intermiſſion in the turning of the work, but with the wheel it always turns the ſame way, ſo that the tool need never be taken off, unleſs it be to examine the work as it is doing.

Braziers, who turn pots, kettles, &c. have their lathe made in a different manner from that uſed by turners, as may be ſeen in plate CLIII. fig. 2.

The puppets and reſts are much ſtronger than thoſe uſed by the turners: their edge-tools, which they call hooks, are alſo of a different ſhape from the chiſſels and other tools uſed by turners, as may be ſeen *ibid.* marked B 1, B 2, B 3, being bent backwards and forwards at the cutting end. And as the common turners work with a round ſtring made of gut, the braziers work with a flat leather-thong, which wrapping cloſe and tight about the rowler of their mandril, commands it with the greater eaſe, and turns it more forcibly about.

Small work in metal is turned in an iron-lathe, called a turn-bench, repreſented in plate CLIII. fig. 3. When this is uſed, it is fixed in the chaps of a vice, and the work being fitted on a ſmall iron-axis, with a drill-barrel fitted upon a ſquare ſhank near the end of it, the workman turns it round with a drill-bow, which he holds in his left hand, while he forms the moulding with a graver or other tool, which he holds in his right.

In turning oval or roſe-work, the common turner's lathe muſt be provided with the additional parts repreſented in plate CLIV. fig. 1. which repreſents the whole machine with all its parts ready for working, A being the fore-puppet, with its apparatus; B, the hinder-puppet; C, a hollow axis, turned into a ſcrew-faſhion, to direct the weight D, by means of the nut E; and F, the ſupport of the tools, which may be raiſed or lowered at pleaſure.

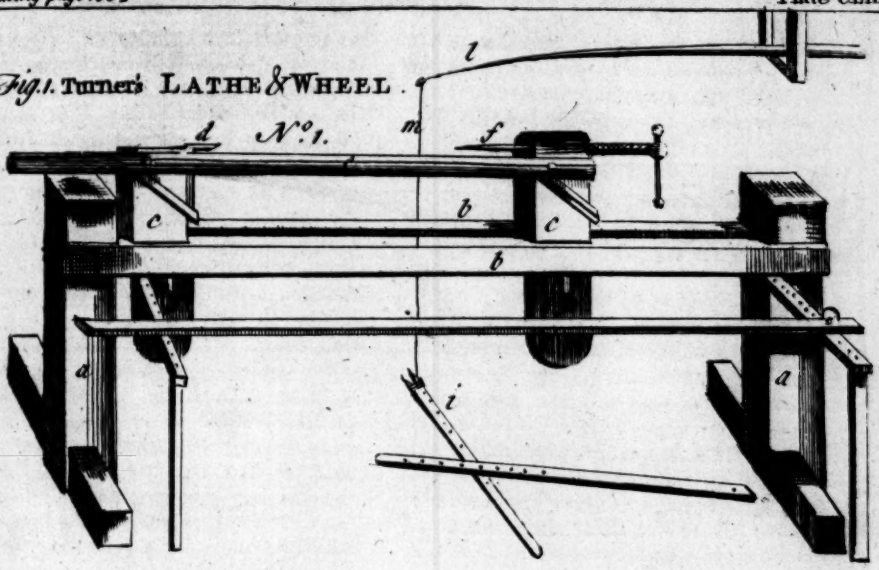
LATHE, or LETH, as uſed in Kent and Suſſex, is part of a county, containing three or four hundreds.

LATHRÆA, GREAT TOOTH-WORT, in botany, a genus of the didynamia-angioſpermia claſs of plants, the corolla whereof conſiſts of a ſingle petal; the tube is longer than the cup; the limb is ringent and ventricoſe; the upper-lip is concave, galeated, and broad, with a narrow crooked apex; the inferior one is leſs, and is reflex, obtuſe, and trifid; the fruit is a roundiſh elaſtic capſule, conſiſting of two valves, and containing only one cell; it is covered with a very large patent cup; the ſeeds are few and roundiſh.

LATHYRUS, CHICKLING PEA, in botany, a genus of the diadelphia-decandria claſs of plants, the corolla of which is papilionaceous; the fruit is a very long, cylindric or compreſſed, acuminated pod, conſiſting of two valves; the ſeeds are numerous, of a cylindric, globoſe, or ſomewhat angular figure. See plate CLIV. fig. 2. and the article APHACA.

LATIAR FESTIVAL, in roman antiqui-

Fig. 1. Turner's LATHE & WHEEL.



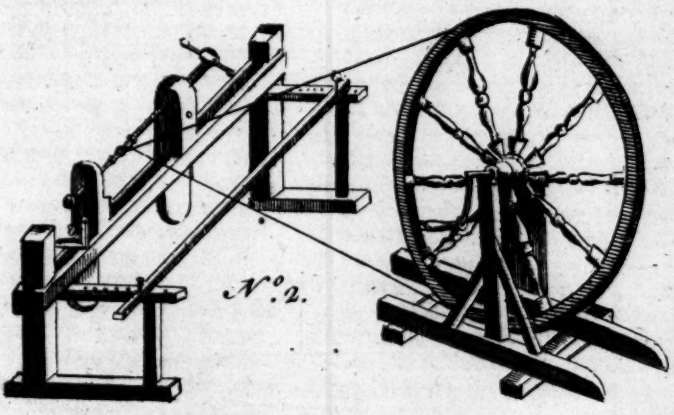


Fig. 3. An IRON-LATHE. for turning small Work in Metall.

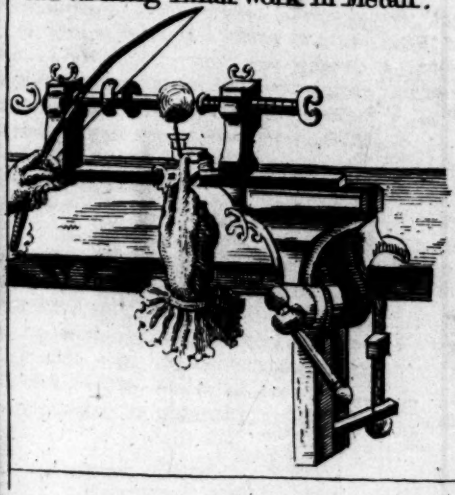
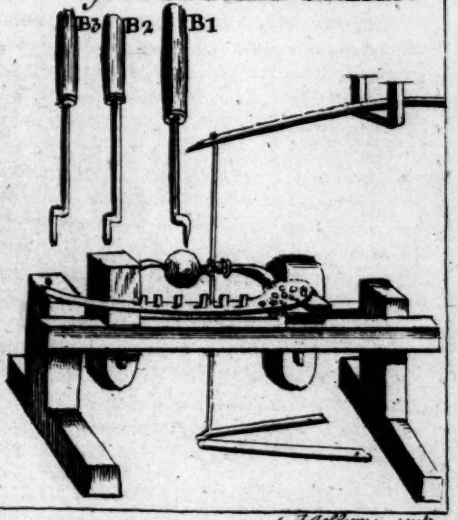


Fig. 2. BRASIERS-LATHE.



J. Jefferys sculp.

BRITISH MUSEUM

BRITISH MUSEUM

Fig. 1. LATHE for turning Oval and Rose-Work.

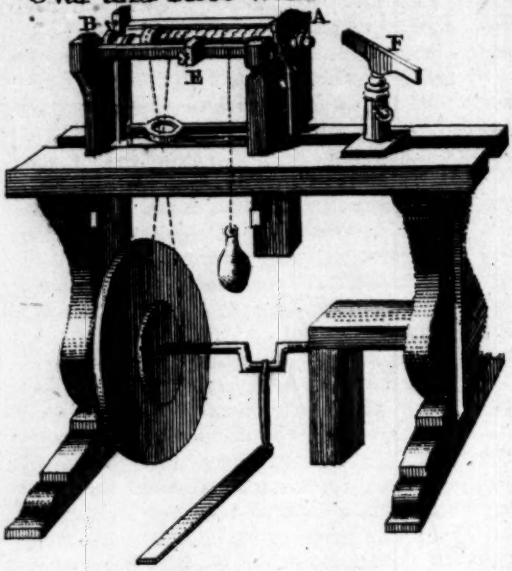
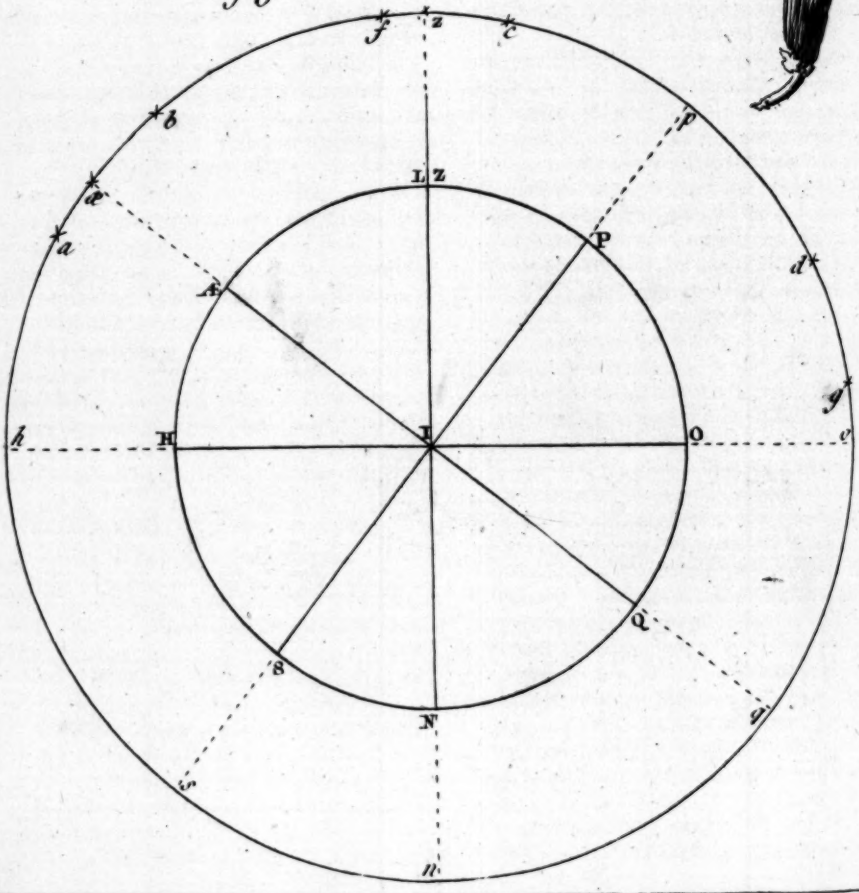


Fig. 2 LATHYRUS.

Fig. 3. LATITUDE.



J. Jefferys sculp.

ty, the ſame with the latin ferie. See the article FERIÆ LATINÆ.

LATICLAVIUM, or LATUS CLAVUS, in the roman antiquity. See the article CLAVUS.

LATIN, a dead language, firſt ſpoken in Latium, and afterwards at Rome; and ſtill uſed in the romiſh church, and among many of the learned.

This language is principally derived from the greek, and particularly from the eolic dialect of that tongue, though it has a great number of words which it borrowed from the languague of the Etruſci, Oſci, and other antient people of Italy; and foreign commerce and wars, in courſe of time, added a great many more.

The latin is a ſtrong nervous language, perfectly ſuitable to the character of the people who ſpoke it; we have ſtill works of every kind, admirably well written in the latin, though there are vaſt numbers loſt. The latin is more figurative than the engliſh, more harmonious than the french, leſs copious than the greek, leſs pompous than the ſpaniſh, leſs delicate than the italian, but cloſer and more nervous than any of them.

The latin tongue was for a while confined almoſt wholly within the walls of Rome; nor would the Romans allow the common uſe of it to their neighbours, or to the nations they ſubdued: but, by degrees they in time became ſenſible of the neceſſity of its being generally underſtood for the conveniency of commerce; and accordingly uſed their endeavours that all the nations ſubject to their empire, ſhould be united by one common language, ſo that at length they impoſed the uſe of it, by a particular law for that purpoſe. After the tranſlation of the ſeat of the empire from Rome to Conſtantinople, the emperors of the eaſt being always deſirous of retaining the title of roman emperors, appointed the latin to be ſtill uſed; but at length neglecting the empire of the weſt, they abandoned all care of the latin tongue, and uſed the greek. Charlemagne coming to the empire of the weſt, revived this language; but at length it gave way, and the french took place of the latin: it was, however, prodigiouſly degenerated before it came to be laid aſide, in which condition it was found at the time of the reformation, when Vives, Eraſmus, &c. began to open the way for its recovery: ſince which time the monkiſh latinity has been declining, and all endeavours have been uſed to retrieve the pure language of the auguſtan age. See the article LANGUAGE.

LATIN CHURCH. See CHURCH.

LATIN BIBLE. See the article BIBLE.

LATISSIMUS, in anatomy, a large muſcle of the back, ſo called from its great breadth. See the article DORSUM.

LATITAT, a writ which iſſues out of the king's bench, ſo denominated from a ſuppoſition that the defendant lies lurking and concealed, after having fled out of Middleſex, into ſome other county; to the ſheriff whereof this writ is directed, commanding him to apprehend the defendant there.

LATITUDE, *latitudo*, in geography, is the diſtance of any place from the equator, meaſured in degrees, minutes, and ſeconds, upon the meridian of that place; and is either north or ſouth, according as the place is ſituated either on the north or ſouth ſide of the equator: thus, let L (plate CLIV. fig. 3.) repreſent London, P the north pole, Æ Q the equator; then will P L Æ Q be the meridian of London, and the arch Æ L the latitude of London; which being equal to 51° 32′, it is ſaid to be 51° 32′ north. See EQUATOR.

The latitude of a place is always equal to the elevation of the pole above the horizon: thus, L Æ, the latitude of London, is equal to the arch P O, the elevation of the pole P, above the horizon H O.

The complement of latitude is always equal to the elevation of the equator above the horizon, or the angle intercepted between the plane of the equator and the plane of the horizon: thus, the complement of the arch Æ L, the latitude of London, is Æ H, which meaſures the elevation of the equator Æ Q, above the horizon H O, or the angle Æ I H intercepted between the planes of the equator and horizon, being 38° 28′, which added to 51° 32′, is equal to 90°. See the article COMPLEMENT.

The latitude of a place, or of a ſhip at ſea, is found by taking the meridian altitude of the ſun, or of a ſtar whoſe declination is known. This problem admits of ſeveral caſes, which are theſe: 1. When the ſun or ſtar has no declination, or is upon the equator, at æ (plate CLIV. fig. 3.) then the zenith-diſtance of the object æ z, is equal to the latitude of the place, which is north latitude, if the ſun or ſtar come to the meridian of the ſouth ſide of the zenith; and ſouth latitude, if on the north ſide. 2. If the ſun or ſtar, when on the meridian, is in the zenith

at

at z; then the declination of the object $æ z$. is equal to the latitude of the place; conſequently, if the declination be north, the latitude will alſo be north; and if ſouth, ſouth. 3. If the ſun or ſtar be between the equator and zenith, as at b; then the latitude of the place is equal to the ſum of the zenith-diſtance and declination of the object; that is, latitude $= zb + bæ$: and it is of the ſame name with the declination, *viz.* north or ſouth, according as the declination is north or ſouth. 4. If the ſun or ſtar be on the contrary ſide the equator, as at a, and conſequently the declination and zenith-diſtance of the ſame name, *viz.* either both north or both ſouth; then the latitude is found by ſubtracting the declination from the zenith-diſtance; that is, latitude $= az - aæ$: and it is of a contrary name with the declination. 5. If the ſun or ſtar be between the zenith and the neareſt pole, as at c, and conſequently both declination and zenith-diſtance be of the ſame name; then from the declination ſubtract the zenith-diſtance, and the remainder will be the latitude; that is, latitude $= cæ - cz$. 6. If the ſun or ſtar be between the horizon and the elevated pole, as at d; then to the altitude add the complement of the declination, and the ſum $do + dp$ will be the latitude. 7. When the obſerved object does not ſet, as at c and d, and conſequently the complement of its declination leſs than the latitude of the place; then the latitude may be found by obſerving both the meridian altitudes, *viz.* the greateſt at c or f, and the leaſt at d or g, without knowing the declination of the object; for if both the altitudes be on the ſame ſide of the zenith, as at c and d, then from the greateſt ſubtract the leaſt, and half the remainder added to the leaſt, gives the latitude; that is, $co - do = cd$, and $\frac{cd}{2}$ $(= pd) + do =$ latitude. But if the greateſt and leaſt meridian-altitudes of the object be upon different ſides of the zenith, as at f and g, then from the ſupplement of the greateſt altitude ſubtract the leaſt, and half the remainder added to the leaſt altitude, will give the latitude; that is, $fo - go = fg$, and $\frac{fg}{2} (= pg) + go =$ latitude.

The latitudes of the ſeveral cities, towns, and other places of note on the globe, may be ſeen ranged each under its proper head, throughout the courſe of this work.

LATITUDE, in aſtronomy, the diſtance of a ſtar or planet from the ecliptic, in degrees, minutes, and ſeconds, meaſured on a circle of latitude drawn through that ſtar or planet, being either north or ſouth, as the object is ſituated either on the north or ſouth ſide of the ecliptic. See the articles ECLIPTIC and CIRCLE *of latitude*. The ecliptic being drawn on the common celeſtial globes, we may ſee what conſtellations it paſſes through: there are uſually ſix circles of latitude, which by their mutual interſections, ſhew the poles of the ecliptic, as well as divide it into twelve equal parts, anſwerable to the number of months in a year. Fig. 1. of plate CLV. repreſents a celeſtial globe, where A G is the ecliptic, N the north, S the ſouth pole of the ecliptic, N A S, N B S, N C S, N D S, *&c.* are circles of latitude. The ſtar H, is in ſo many degrees, minutes, and ſeconds of north latitude, as the arch H A amounts to; and the ſtar I, is in ſouth latitude, the quantity whereof is meaſured by the arch I B. From what has been ſaid, it appears that we muſt carefully diſtinguiſh the different notions of latitude, when applied to ſtars in the heavens, and to places on the earth; that is, between latitude in aſtronomy, and latitude in geography; for in the heavens, or on the celeſtial globe, it is the diſtance from the ecliptic; but on the earth, or upon the terreſtrial globe, it is the diſtance from the equator. Indeed, ſometimes we conſider the diſtance of the heavenly bodies from the celeſtial equator; but this is called declination, for finding which, ſee the article DECLINATION.

The latitude of a planet is either heliocentric, or geocentric. See the articles HELIOCENTRIC and GEOCENTRIC.

North aſcending LATITUDE, *of the moon*, is when ſhe proceeds from the aſcending node towards her northern limit, or greateſt elongation. See the articles MOON, ELONGATION, and NODE.

North deſcending latitude, is when the moon returns from her northern limit to the deſcending node. South deſcending latitude, is when ſhe proceeds from the deſcending node to her ſouthern limit. South aſcending latitude, is when ſhe returns from her ſouthern limit to her aſcending node.

The ſame thing holds good of the other planets. See the articles ASCENDING and DESCENSION.

LATITUDINARIAN, a perſon of moderation,

deration, with regard to religious opinions who believes there is a latitude in the road to heaven, which may admit people of different perſuaſions.

In this ſenſe all proteſtants are latitudinarians, ſince they allow that many among the papiſts may be ſaved; though the bigotry of theſe laſt will not permit them to allow the ſame with reſpect to proteſtants.

LATRIA, λατρεια, among papiſts, ſignifies the worſhip due to God only; in contradiſtinction to dulia, which is that paid to ſaints. See the articles ADORATION, WORSHIP, SAINT, &c.

LATTEN, denotes iron-plates tinned over, of which tea-caniſters are made.

Plates of iron being prepared of a proper thinneſs, are ſmoothed by ruſting them in an acid liquor, as common water made eager with rye: with this liquor they fill certain troughs, and then put in the plates, which they turn once or twice a day, that they may be equally ruſted over; after this they are taken out, and well ſcowered with ſand, and, to prevent their ruſting again, are immediately plunged into pure water, in which they are to be left till the inſtant they are to be tinned or blanched, the manner of doing which is this: they flux the tin in a large iron-crucible, which has the figure of an oblong pyramid with four faces, of which two oppoſite ones are leſs than the two others. The crucible is heated only from below, its upper part being luted with the furnace all round. The crucible is always deeper than the plates, which are to be tinned, are long; they always put them in downright, and the tin ought to ſwim over them; to this purpoſe artificers of different trades prepare plates of different ſhapes, tho' Mr. Reaumur thinks them all exceptionable. But the Germans uſe no ſort of preparation of the iron, to make it receive the tin, more than the keeping it always ſteeped in water, till the time; only when the tin is melted in the crucible, they cover it with a layer of a ſort of ſuet, which is uſually two inches thick, and the plate muſt paſs through this before it can come to the melted tin. The firſt uſe of this covering is to keep the tin from burning; for if any part ſhould take fire, the ſuet would ſoon moiſten it, and reduce it to its primitive ſtate again. The blanchers ſay, this ſuet is a compounded matter; it is indeed of a black colour, but Mr. Reaumur ſuppoſed that to be only an artifice to make it a ſecret, and that it is only coloured with ſoot or the ſmoke of a chimney; but he found it true ſo far, that the common unprepared ſuet was not ſufficient; for after ſeveral attempts, there was always ſomething wanting to render the ſucceſs of the operation certain. The whole ſecret of blanching, therefore, was found to lie in the preparation of this ſuet; and this, at length, he diſcovered to conſiſt only in the firſt frying and burning it. This ſimple operation not only gives it the colour, but puts it into a condition to give the iron a diſpoſition to be tinned, which it does ſurpriſingly.

The melted tin muſt alſo have a certain degree of heat, for if it is not hot enough, it will not ſtick to the iron; and if it is too hot, it will cover it with too thin a coat, and the plates will have ſeveral colours, as red, blue and purple, and upon the whole will have a caſt of yellow. To prevent this, by knowing when the fire has a proper degree of heat, they might try with ſmall pieces of iron; but in general, uſe teaches them to know the degree, and they put in the iron when the tin is at a different ſtandard of heat, according as they would give it a thicker or thinner coat. Sometimes alſo they give the plates a double layer, as they would have them very thickly covered. This they do by dipping them into the tin when very hot the firſt time, and when leſs hot the ſecond. The tin which is to give the ſecond coat, muſt be freſh covered with ſuet, and that with the common ſuet, not the prepared.

LATTEN-BRASS, plates of milled braſs, reduced to different thickneſs, according to the uſes it is intended for.

LATUS RECTUM, in conic ſections, the ſame with parameter. See PARAMETER.

LATUS TRANSVERSUM, in the hyperbola, that part of the tranſverſe diameter, intercepted between the vertices of the two oppoſite ſections. See the article HYPERBOLA.

LATUS PRIMARIUM, a right line belonging to a conic ſection, drawn through the vertex of the ſection, and within it. See the article CONIC SECTIONS.

LAVAMUND, a city of Germany, in the circle of Auſtria, and dutchy of Carinthia, ſituated at the confluence of the rivers Drave and Lavamund: eaſt long. 15°, and north lat. 47°.

LAVANDULA, LAVENDER, in botany, a genus of the didynamia-gymnoſpermia claſs of plants, the corolla whereof conſiſts

ſiſts of a ſingle ringent petal; the tube is cylindric, and longer than the cup; the limb is patent; the ſuperior lip is greater, bifid, and patent; the inferior one trifid, with all the lacinia roundiſh, and almoſt equal; there is no pericarpium; the cup is connivent at the mouth, and contains four roundiſh ſeeds.

Lavender is a cephalic, nervous, and uterine medicine: it is alſo good in vertigoes, lethargies, ſpaſms, and even in palſies, and apoplexies. It diſpels flatulencies alſo, and is good in ſuppreſſions of urine and the menſes. There is a water diſtilled from it well known for its fragrancy and cephalic virtue.

LAVATERA, in botany, a genus of the monadelphia-polyandria claſs of plants; the corolla whereof conſiſts of five plane, patent, vertically cordated petals, growing together at the baſe; the fruit conſiſts of a number of capſules; the receptacle is columnar, and affixed to the capſules; the ſeed is ſingle and kidney-ſhaped.

LAVATORY, or LAVOREDO, an appellation given to certain places in Chili and Peru, where gold is ſeparated from earth by waſhing. See the articles GOLD and WASHING *of ores*.

LAUBACH, a city of Germany, in the circle of Auſtria, and the capital of the dutchy of Carinthia; eaſt long. 14° 40′, and north lat. 46° 28′.

LAUDA, a town of Germany, in the circle of Franconia and biſhopric of Wurtſburg: eaſt long. 9° 30′, and north lat. 49° 35′.

LAUDANUM, a preparation of opium. See the article OPIUM.

LAUDER, a borough-town of Scotland, in the ſhire of Mers, ſituated twenty-two miles ſouth-eaſt of Edinburgh.

LAVENDER, the ſame with lavandula. See the article LAVANDULA.

LAVER, a ſacred utenſil in the temple of Jeruſalem, conſiſting of a baſon, whence they drew water by cocks.

LAUFFEN, a town of Germany, in the circle of Swabia and dutchy of Wirtemburg: ſituated on the river Neckar: eaſt long. 9° 5′, north lat. 49°.

LAUFFENBURG, a town of Germany, in the circle of Swabia, ſituated on the Rhine: eaſt long. 8°, north lat. 47° 36′.

LAUGHTER, a paſſion peculiar to mankind, occaſioned by ſomething that tickles the fancy. See the articles PASSIONS.

In laughter, the eye-browsare raiſed about the middle, and drawn down next the noſe; the eyes are almoſt ſhut; the mouth opens, and ſhews the teeth; the corners of the mouth being drawn back, and raiſed up; the cheeks ſeem puffed up, and almoſt hide the eyes; the face is uſually red, and noſtrils open, and the eyes wet.

LAUNCESTON, the county-town of Cornwal, thirty-ſix miles weſt of Exeter: weſt long. 4° 40′, north lat. 50° 45′. It ſends two members to parliament.

LAUNCH, in the ſea-language, ſignifies to put out: as, *launch the ſhip*, that is, put her out of the dock: *launch aft*, or *forward*, ſpeaking of things that are ſtowed in the hold, is, put them more foreward: *launch, ho!* is a term uſed when a yard is hoiſted high enough, and ſignifies hoiſt no more.

LAUNDER, among miners, a place where they waſh the powdered ore. See the article WASHING *of ores*.

LAURA, in church-hiſtory, a name given to a collection of little cells, at ſome diſtance from each other, in which the hermits, in antient times, lived together in a wilderneſs.

Theſe hermits did not live in community, but each monk provided for himſelf in his diſtinct cell. The moſt celebrated lauras mentioned in eccleſiaſtical hiſtory, were in Paleſtine; as the laura of St. Euthymius, at four or five leagues diſtance from Jeruſalem; the laura of St. Saba, near the brook Cedron; the laura of the Towers, near the river Jordan, *&c.*

LAUREATION, in the univerſities of Scotland, ſignifies the act of taking the degree of maſter of arts, which the ſtudents are permitted to do after four years ſtudy.

LAURENCE, or *Canons regular of St.* LAURENCE, a religious congregation in France, ſaid to have been founded by St. Benedict.

LAURENTALIA, in roman antiquity, a feſtival celebrated in honour of Acca Laurentia, Romulus's nurſe.

LAURUS, in botany, a genus of the enneandria-monogynia claſs of plants, the corolla whereof conſiſts of ſix ovato-acuminated, concave, and erect petals, the nectarium is compoſed of three coloured, acuminated tubercles, terminating in two hairs, and ſtanding round the germen; the fruit is a drupe of an oval, acuminated figure, containing only one cell, and contained in the corolla; the ſeed is a ſingle, ovato-acuminated nut, and its kernel is of the ſame figure.

This genus comprehends the laurus, or bay-

bay-tree, the cinnamon-tree, the camphire-tree, the benjamin-tree, and the ſaſſafras-tree. See the article CINNAMON, CAMPHOR, BENJAMIN, and SASSAFRAS.

The leaves and berries of the bay-tree, or common laurus, are only uſed in medicine, and are warm carminatives, and ſometimes exhibited in this intention againſt flatulent colics, ; and likewiſe in hyſterical diſorders. Their principal uſe, in the preſent practice, is in glyſters, and ſome external applications. The leaves enter our common fomentation, and the berries the plaſter and cataplaſm of cumin ; they alſo give name to an electuary, which is little otherwiſe uſed than in glyſters.

LAUSANNE, a city of Switzerland, in the canton of Bern, ſituated on the north ſide of the lake of Geneva : eaſt long. 6° 31′, and north lat. 46° 33′.

LAUTERBURG, a town of Germany, in the circle of the Upper Rhine, and landgravate of Alſace : eaſt long. 8°, and north lat. 48° 45′.

LAUTERBURG is alſo a town of Poland, in the province of Royal Pruſſia : eaſt long. 20°, and north lat. 53° 30′.

LAW, in general, is defined to be a certain rule for the good government of mankind in ſociety. See GOVERNMENT. This rule or law is nothing but a decree, by which the ſuperior obliges thoſe ſubject to him, to accommodate their actions to the directions preſcribed therein. But that a law may exert its force in the minds of thoſe to whom it is promulgated, it is requiſite that the law-giver and the law be likewiſe known. The legiſlator of the laws of nature, can be no other than the Creator of the univerſe. No man in civil ſociety can be ignorant who it is that has power over him ; and of the laws he has notice given him, by a publication plainly and properly made, in which theſe two things ought to be aſcertained, that the author of the law is he who hath the ſupreme authority in the community, and that this or that is the true meaning of the law. The firſt is known, if it be promulged with his own mouth, under his own hand, or if it be done by proper delegates regularly admitted to that office : they muſt be thus judiciouſly executed, and, beſides that, contain nothing derogatory to the ſovereign power. As to the true ſenſe, after the greateſt plainneſs uſed by the promulgers, an explication is to be ſought of the legiſlator, or thoſe who are publicly appointed to give judgment according to law. See the article JUDGE.

Every perfect law has two parts ; the one directing what is to be done, or omitted ; the other declaring the puniſhment incurred, by neglecting to do what is commanded, or attempting what is prohibited. And herein all the force of law conſiſts. See the article PUNISHMENT.

Law may be divided, with reſpect to its authors, into divine and human : the former may be conſidered as twofold, to wit, natural or moral, and poſitive. Natural law is that which God has made known to mankind by the light of natural reaſon. Poſitive law is that which he has revealed by his prophets : ſuch were the laws delivered to the Jews relating to the divine worſhip and polity peculiar to that people.

Civil or human laws, conſidered with reſpect to the legiſlator's two offices, of judging and compelling, may be divided into diſtributive and penal. Diſtributive law, is that which gives every ſubject what properly belongs to him, forbidding others to injure him either in his privileges or property : and penal law is that which determines, or appoints, what puniſhments ſhall be inflicted on thoſe who violate the diſtributive laws ; it is mandatory, and ſpeaks only to the public officers, or magiſtrates.

The laws of any kingdom, or ſtate, firſt began with the ſtate itſelf : and if we conſider the world as one univerſal ſociety, or Europe as one great commonwealth, the law by which ſeparate nations is governed, with reſpect to treaties, alliances, the ſending embaſſadors, *&c.* is called jus gentium, or the law of nations : but when it is conſidered as made up of particular ſtates the law which regulates the public order of each, is called jus publicum ; and that law which determines the private rights of men, is called jus civili, or civil law. See CIVIL LAW.

The laws of England are at preſent divided into the common law, which is the moſt antient law of the kingdom ; the ſtatute-law, made by the king and both houſes of parliament ; and particular cuſtoms in ſeveral parts of the kingdom : but our laws are more largely divided into the crown law ; the law and cuſtom of parliament ; the common law ; the ſtatute-law ; reaſonable cuſtoms ; the law of arms ; eccleſiaſtical or canon-law ; the civil law ; the foreſt-law ; the law of

marque and repriſals; the law of merchants; martial law, &c. See the articles COMMON LAW, STATUTE, PARLIAMENT, FOREST, &c.

Our laws have great reſpect to life, liberty, freehold, and inheritance: their uſe is to ſecure the continuance of thoſe bleſſings we enjoy; and they have therefore a particular relation to perſons and their eſtates, to crimes and miſdemeanors, &c. See ESTATE, CRIME, &c.

LAWS *of nature*, or *Motion*, in phyſics, are axioms, or general rules of motion and reſt, obſerved by all natural bodies in their actions upon one another. Of theſe Sir Iſaac Newton has eſtabliſhed three, which may be ſeen under the article MOTION.

Salic LAW. See the article SALIC.

LAW *of arms*, is a law which gives precepts how to proclaim a war, to attack the enemy, and to puniſh offenders in the camp.

LAWENBURG, a city of Germany, in the dutchy of the ſame name, ſituated on the river Elbe, fifteen miles north-eaſt of Lunenburg: eaſt long. 10° 37′, and north lat. 53° 45′.

LAWING *of Dogs*, the ſame with expeditating. See the article EXPEDITATE.

LAWINGEN, a town of Germany, in the circle of Swabia, ſituated on the Danube: eaſt long. 10° 20′, and north lat. 48° 38′.

LAWLESS COURT, a court ſaid to be held annually on King's hill, at Rochford, in Eſſex, on the Wedneſday morning after Michaelmas-day, at cock-crowing, where they whiſper, and have no candle nor any pen and ink, but only a coal. Perſons who owe ſuit, or ſervice, and do not appear, forfeit double their rent every hour they are miſſing.

This ſervile attendance, Camden informs us, was impoſed on the tenants for conſpiring at the like unſeaſonable time to raiſe a commotion. The court belongs to the honour of Raleigh, and to the earl of Warwick, and is called lawleſs from its being held at an unlawful hour.

LAWN, a ſpacious plain in a park, or adjoining to a noble ſeat. As to the dimenſions of a lawn, in a large park, it ſhould be as extenſive as the ground will permit; and, if poſſible, it ſhould never be leſs than fifty acres: but in gardens of a moderate extent, a lawn of ten acres is ſufficient; and in thoſe of the largeſt ſize, fifteen acres. The beſt ſituation for a lawn, is in the front of the houſe; and here, if the houſe front the eaſt, it will be extremely convenient; but the moſt deſirable aſpect for a lawn, is that of the ſouth-eaſt. As to the figure of the lawn, ſome recommend an exact ſquare, others an oblong ſquare, ſome an oval, and others a circular figure: but neither of theſe are to be regarded. It ought to be ſo contrived, as to ſuit the ground; and as there ſhould be trees planted for ſhade on the boundaries of the lawn, ſo the ſides may be broke by irregular plantations of trees, which, if there are not ſome good proſpects beyond the lawn, ſhould bound it on every ſide, and be brought round pretty near to each end of the houſe. If in theſe plantations round the lawn, the trees are placed irregularly, ſome breaking much forwarder on the lawn than others, and not crowded too cloſe together, they will make a better appearance than any regular plantations can poſſibly do; and if there are variety of trees properly diſpoſed, they will have a good effect: but only thoſe which make a fine appearance, and grow large, ſtraight and handſome ſhould be admitted here. The moſt proper trees for this purpoſe, are the elm, oak, cheſnut and beech; and if there are ſome clumps of ever-green trees intermixed with the others, they will add to the beauty of the whole, eſpecially in the winter-ſeaſon; the beſt ſorts for this purpoſe, are lord Weymouth's pine, and the ſilver and ſpruce firs.

LAWSONIA, in botany, a genus of the octandria-monogynia claſs of plants; the corolla whereof conſiſts of four, plane, ovato-lanceolated, patent petals; the fruit is a globoſe capſule, terminating in a point, and containing four cells; the ſeeds are numerous, angular and acuminated.

LAWYER ſignifies a counſellor, or one that is learned or ſkilled in the law.

LAXATIVE MEDICINES, thoſe which looſen the belly, and diſpoſe a perſon to go frequently to ſtool: ſuch are all cathartic, emollient, and lubricating medicines. See the articles CATHARTICS, EMOLLIENTS, &c.

LAXEMBURG, a town of Germany, in the circle of Auſtria, ten miles ſouth of Vienna.

LAY, in french poetry, denotes a ſhort poem, ſomething like our ballads.

LAY-BROTHERS, among the romaniſts, thoſe pious, but illiterate perſons, who devote

devote themſelves, in ſome convent, to the ſervice of the religious. They wear a different habit from that of the religious, but never enter into the choir, nor are preſent at the chapters; nor do they make any other vow, except of conſtancy and obedience. In nunneries, there are alſo lay-ſiſters.

LAY *the land*, at ſea, is ſaid when they get out of ſight of land.

LAY-LAND, or LEY-LAND, in huſbandry, fallow ground, or ſuch as lies untilled.

LAY-MAN, one who follows a ſecular employment, or has not entered into holy orders.

LAY-MAN, among painters, a ſmall ſtatue either of wax or wood, whoſe joints are ſo formed, that it may be put into any attitude or poſture. Its principal uſe is for adjuſting the drapery in cloathing of figures.

LAYERS, in gardening, are tender ſhoots, or twigs of trees, laid or buried in the ground; till having ſtruck root, they are ſeparated from the parent-tree, and become diſtinct plants.

Many trees may be thus propagated by layers; the ever-greens about Bartholomew-tide, and other trees about the month of October.

The operation is performed by ſlitting the branches a little way, and laying them about half a foot under the mould: the ground ſhould firſt be made very light, and after they are laid, they ſhould have a little water given them. If they do not comply well in laying them down, they muſt be pegged down with a hook or two; and if they have taken ſufficient root by the next winter, they ſhould be cut off from the main plants, and planted in the nurſery. Some twiſt the branch, or bare the rind; and if it be out of the reach of the ground, they faſten a tub or baſket near it, which they fill with good mould and lay the branch in it.

LAZAR-HOUSE, or LAZARETTO, a public building, in the nature of an hoſpital, to receive the poor and thoſe afflicted with contagious diſtempers; in ſome places, lazarettos are appointed for the performance of quarantine; in which caſe, thoſe are obliged to be confined in them who are ſuſpected to have come from places infected with the plague. This is uſually a large building, at ſome diſtance from a city, whoſe apartments ſtand detached from each other, where veſſels are unladen, and the crew ſhut up for about forty days, more or leſs, according to the time and place of their departure. The lazaretto of Milan is eſteemed one of the fineſt hoſpitals in Italy.

LAZARITES, *or fathers of St.* LAZARUS, a religious congregation of regular clerks, inſtituted in France in the ſeventeenth century, by M. Vincent. They take their name from a houſe in the ſuburbs of Paris, where they have a ſeminary, called the ſeminary of good children. The vows they make are ſimple; and, upon occaſion, may be diſpenſed with.

LAZULI, or *Lapis* LAZULI, in natural hiſtory, one of the ores of copper, the baſis of which is a cryſtalline matter, coloured with that elegant blue which copper gives to all alkaline liquors.

It is a very compact and hard ſtone, and takes a high poliſh, and therefore is worked into a number of toys. It is found in detached lumps of the ſize of a man's fiſt, but often ſmaller, and ſometimes of four or five pounds weight. It is never covered with any coat or cruſt, but reſembles thoſe ſtones which, having been waſhed off from whole ſtrata, are rounded by accidents afterwards. It is naturally of a ſmooth and gloſſy ſurface, and its general colour is an elegant blue, but variegated in a beautiful manner with ſpots or clouds of white, and with veins of a fine ſhining gold-colour.

The lapis lazuli is found in many parts of the world, but that of Aſia and Africa is much ſuperior both in beauty and real value to the bohemian and german kind, which is too often ſold in its place.

Chemical writers give ſeveral proceſſes for magiſteries, tinctures, and elixirs of lapis lazuli; but they are wholly out of uſe.

Its virtues, in medicine, are thoſe of a very violent purgative and emetic, which are owing to the copper it contains; but its violence in the operation has frighted people out of the uſe of it.

Its great uſe therefore, beſide the poliſhing as a gem, is the making the fine blue uſed in painting, called ultramarine, which is obtained from it by calcination. See the article ULTRAMARINE.

LEA, a river which riſes near Luton in Bedfordſhire, and falls into the Thames a little below Blackwall.

LEAD, *plumbum*, ♄, in natural hiſtory, a coarſe, impure metal, called by chemiſts ſaturn. See the article METAL.

Lead is the heavieſt of the metals next after

after gold; it is, indeed, conſiderably lighter than quickſilver, but the want of malleability denying that ſubſtance a place in the claſs of metals, lead is among them the ſecond in weight. It is the ſofteſt of all the metals; eaſily flattened under the hammer, and ductile in a very great degree, though much leſs ſo than gold. Its colour is a pale bluiſh grey, it is very little ſubject to ruſt, and is the leaſt ſonorous of all the metals, except gold, with which it ſeems nearly on an equality, in regard to this property in its common ſtate; but Mr. Reaumur has diſcovered that, if caſt in the form of a ſegment of a ſphere, it has ſome ſound when ſtruck upon; a property which gold does not acquire by being caſt in the ſame form. See the article GOLD.

It requires the leaſt degree of fire of all metals, except tin, to put it in fuſion. It acquires this fluid ſtate, long before it changes its colour; whereas the other metals, except tin, all become red-hot before they run: after melting, it very readily calcines into a grey powder, which, if the fire be increaſed and the matter often ſtirred, becomes yellow, and afterwards of a fine florid red: this is the minium, or common red lead of the ſhops. If the fire be made yet more vehement, it runs into an oleaginous matter, which, as it cools, becomes of a yellowiſh or reddiſh colour, and is compoſed of a number of thin laminæ; this is litharge. Though theſe ſeveral ſubſtances have nothing of the appearance of the metal they are produced from, yet, if a little iron-filings be added to them over the fire, or only ſome pieces of charcoal, or any other oily inflammable matter be thrown in, they become lead again. The ſcoriæ of lead, left to themſelves in a ſtrong fire, always run into glaſs, and in that form make their way through all ſorts of veſſels.

Lead very readily and eaſily amalgamates with mercury, and as readily mixes in fuſion with all the other metals, except iron, though leſs eaſily with copper than the reſt. The ſpecific gravity of lead is, to that of water, as 11325 to 1000.

Lead, when in the bowels of the earth, enters into the body of cryſtals, as is very frequently the caſe with that cryſtal which is found about lead-mines, and influences its figure ſo far as to give it a cubic form. It often does this without at all altering its colour; but when it tinges it likewiſe, the colouring it gives is yellow.

The topaz, among the gems, owes its yellow colour to this metal; and, in the factitious gems, we find that the tinge it gives to the compoſition is always a yellow, approaching to that of the topaz.

Lead-ore is readily diſtinguiſhed to be ſuch, being nearly of the colour of lead itſelf, or a little darker; very bright and gloſſy when freſh broken; and compoſed either of cubic or parallelopiped-maſſes, or of ſmaller granules, or elſe of ſtriæ: in the firſt of theſe ſtates it is commonly called potter's ore or diced lead-ore; in the ſecond, ſteel-grained-ore; and in the third, antimoniated ore, from its reſemblance to antimony.

Lead is more eaſily ſeparated from its common ore than any other metal; there requires nothing for this purpoſe but a common wood-fire, kept up to a due ſtrength by a blaſt of bellows. The lead-ore is thrown into this fire upon the wood, and the melted metal runs into a hollow at the bottom of the furnace made to receive it, from which they ladle it out and caſt it into large maſſes. Such ores of lead as contain earth and ſtones are to be powdered and waſhed before they are committed to the fire, and ſuch as contain pyrites or marcaſite, which is no uncommon thing, muſt be roaſted two or three times, in order to burn away the ſulphur they are debaſed with; then powdered and waſhed, in order to their being committed to the fire, and finally mixed with the common black flux, if very refractory. See the article FLUX.

If there be any occaſion to ſeparate lead from a mixture of copper in the regulus, nothing is more eaſy than to do it by a common fire; the heat of which being enough to melt lead, though not to fuſe copper, will run it all off and leave the copper pure behind.

Lead is much uſed in building, eſpecially for coverings, gutters, pipes and glazing; for which uſes, it is either caſt into ſheets in a mould, or millet; which laſt is by much the leaſt ſerviceable, not only on account of its thinneſs, but alſo becauſe it is ſo exceedingly ſtretched in milling, that when it comes to lie in the hot ſun, it ſhrinks and cracks, and conſequently will not keep out the water. For the manufacture of all which, ſee the article PLUMBERY.

Lead has been celebrated by the chemical

writers

writers for very great virtues in medicine, but, upon the whole, it ſeems to be a metal very cautiouſly to be given internally, and rather calculated for outward application. Its ore is poiſonous: the ſteam which ariſes from the furnace where it is worked, infects the graſs of all the neighbouring places, and kills the animals that feed on it; and among the preparations of it, the ſalt called ſaccharum ſaturni, which is by much its beſt form for medicine, and which is able to do great ſervice, in hæmorrhages and ſome other caſes; it is apt, however, to bring on colics of a very violent kind, and ſo many other diſorders, that the remedy often proves worſe than the diſeaſe. The preparations of lead, are, 1. Minium, or red-lead. 2. Litharge. 3. Burnt-lead, plumbum uſtum. 4. Ceruſe. 5. Salt, or ſugar of lead, ſaccharum ſaturni. See MINIUM, LITHARGE, CERUSE, and SACCHARUM SATURNI.

rnt LEAD is thus prepared: cut a quantity of the thinneſt milled lead that can be got into ſmall plates; fill an earthen veſſel, that will bear the fire, with theſe plates and powder of common brimſtone, laid *ſtratum ſuper ſtratum*; ſet it over the fire, and when the ſulphur is burnt away, the lead will be found reduced to a blackiſh powder. Five ounces of ſulphur will ſerve for half a pound of lead. The matter is to be ſtirred while it remains on the fire; and when it is cold, the powder is to be waſhed three or four times with common water, and then dried for uſe; being of the ſame virtue with litharge, or red-lead, in ointments and plaſters. Mixed into an unguent with lard alone, it makes a good ointment for the piles. However, it ought to be remarked, that it is intended only for external uſe.

Beſides the preparations already mentioned, we find mention of balſam and magiſtery of lead. Balm, or balſam of lead, is only an oil drawn, by diſtillation, from ſalt of lead diſſolved in ſpirit of turpentine. Magiſtery of lead is the calx of lead purified and ſubtiliſed in aqua fortis; which, being ſeveral times waſhed, becomes extremely white, and is mixed with pomatums for the face and complexion.

ck LEAD, or MOCK-LEAD, *plumbago*. See the article PLUMBAGO.

ſs of LEAD. See the article GLASS.

LEAF, *folium*, in the natural hiſtory of plants, a very eſſential and ornamental part of plants, whoſe chief office is to ſubtiliſe and give more ſpirit to the abundance of nouriſhing ſap, and to convey it to the little buds.

Botaniſts conſider the leaves of plants, with regard to their ſtructure, their ſurface, figure, conſiſtence, edges, ſituation and ſize. With regard to their ſtructure, they are either ſingle, as thoſe of the apple-tree and pear-tree; or double, as thoſe of angelica and parſley. With reſpect to their ſurface, they are either flat, as the nummularia and origany; or in bunches, as ſeveral kinds of kali and houſleeks. With regard to their conſiſtence, they are either thin and fine, as thoſe of St. John's wort; or thick and groſs, as thoſe of portulaca; or fleſhy, as thoſe of ſeveral kinds of houſleek; or woolly, as thoſe of gnaphalium. With regard to their edges, leaves are either cut ſlightly, as ſome ſpecies of geums; or deep, as in ſome of the jaceas. With regard to their ſituation, they are either ranged alternately, as the alaternus; or oppoſite to each other, as the phillyrea and the mints. With regard to their ſize, they are either very large, as thoſe of the colocaſia and ſphondylium; or moderate, as thoſe of biſtort and the fig-tree; or ſmall, as thoſe of the apple-tree and pear-tree; or very ſmall, as that of St John's wort.

Moſt ſorts of ſmall plants, and alſo ſeveral ſorts of trees, which put forth a root at the ſmall end of the ſeed, put out two ſmall leaves that are not at all like thoſe that grow on the plant or tree, as ſoon as the root has taken hold of the ground; and afterwards between theſe falſe leaves, there comes forth a ſhoot which produces leaves like thoſe of the plant or tree from which it came: of this manner of growth, there is an infinite number of plants and trees.

Doctor Grew juſtly obſerves, that the fibres of leaves are compoſed of two general kinds of veſſels, *viz.* thoſe for ſap and thoſe for air; and, that theſe are ramefied out of greater into leſs, like the veins and arteries in animals: and all naturaliſts aſcribe to them very important uſes; the moſt ſingular of which is, that they, in ſome meaſure, perform the ſame office for the ſupport of the vegetable life, as the lungs of animals do for the ſupport of animal life; and, that it is highly probable, that plants draw ſome part of their nouriſhment from the air through their leaves. Theſe, in the

ſpring,

ſpring, receive the crude humours, divide them very minutely, and carry back great plenty of elaborated juice to the plant. By theſe a tranſpiration is carried on of what is unprofitable, anſwering to the diſcharge in animal bodies made by ſweat; for ſometimes the excretory veſſels of the leaves are ſo over-charged by the great plenty of the diſtending humour, or juice, that they burſt in the middle, and let go the more ſubtile parts; and it frequently happens, that, in a hot ſeaſon, a great plenty of juices are this way diſcharged and imbibed. Thus manna is found to exude as well from the leaves as from the bark, eſpecially if a cold night follows a hot day; and the ſame thing frequently happens in ſeveral other plants and trees, as we learn from the bees flying to the lime-tree, that they may gather that gummous ſubſtance from its leaves; but if the heat be leſs, all the ſuperfluous juices, except thoſe which are, perhaps, tranſmitted by inſenſible perſpiration thro' the arterial veſſels, exhale naturally, and return into the trunk. It is alſo found, that the bibulous veſſels, dried by the diurnal heat, imbibes, eſpecially in the night-time, thoſe watry vapours which ariſe in form of a very thin dew, and ſo make amends for the loſs made by the arteries, by the new moiſtures received. Laſtly, the leaf ſerves, in a ſingular manner, to nouriſh the eye, or gem, until growing by degrees to a greater bulk, it preſſes the veſſels of the foot-ſtalk together, from whence the humour is, by little and little, ſtopped in the leaf till it cannot any more return thro' the footſtalk; which, by the ceaſing of the afflux and reflux of the nutritious juice, grows putrid, whence a conſumption being cauſed, the leaf dies, and falls off; which is the chief cauſe of the falling of the leaves in autumn.

Some have made the obſervation, that all ever-greens have their wood cloſe and compact between their annular circles; and, that their holding their leaves all the winter, proceeds from the nature of their ſap, which is of a clammy and turpentine nature; and, that this ſap is eaſily condenſed by the cold, and requires a great deal of heat to make it thin and put it in motion: thus a little cold, condenſes or ſtiffens pitch or turpentine, but it muſt be a froſt that ſtays the motion of water. From whence it happens, that thoſe trees which hold their leaves will grow much better under the droppings of other great trees, than ſuch as ſhed their leaves, becauſe their turpentine-ſap ſhoots off the drops, and prevents their entering the veſſels in too great quantities. The various forms and kinds of leaves, as pinnated, digitated, crenated, haſtated, *&c.* are deſcribed under the articles PINNATED, CRENATED, HASTATED, *&c.*

LEAF, in architecture, the repreſentation of the leaf of the acanthus on the capital of the corinthian and compoſite orders. See the articles CORINTHIAN and COMPOSITE.

LEAF, in clocks and watches, an appellation given to the notches of their pinions. See the articles CLOCK and WATCH.

LEAGUE, a meaſure of length, containing more or leſs geometrical paces, according to the different uſages and cuſtoms of countries. A league at ſea, where it is chiefly uſed by us, being a land meaſure moſtly peculiar to the French and Germans, contains three thouſand geometrical paces, or three engliſh miles. The french league ſometimes contains the ſame meaſure, and in ſome parts of France it conſiſts of three thouſand five hundred paces: the mean or common league conſiſts of two thouſand four hundred paces, and the little league of two thouſand. The ſpaniſh leagues are larger than the french, ſeventeen ſpaniſh leagues making a degree, or twenty french leagues, or ſixty-nine and an half engliſh ſtatute miles. The dutch and german leagues contain each four geographical miles. The perſian leagues are pretty near of the ſame extent with the ſpaniſh; that is, they are equal to four italian miles; which is pretty near to what Herodotus calls the length of the perſian paraſang, which contained thirty ſtadia, eight whereof, according to Strabo, make a mile.

LEAGUE alſo denotes an alliance or confederacy between princes and ſtates for their mutual aid, either in attacking ſome common enemy, or in defending themſelves.

LEAGUES *of the Griſons*, are a part of Switzerland, conſiſting of three ſubdiviſions, *viz.* the upper league, the league of the houſe of Gad, and the league of the ten juriſdictions. See the article SWITZERLAND.

LEAK, among ſeamen, is a hole in the ſhip through which the water comes in. To ſpring a leak, is ſaid of a ſhip that begins to leak. To ſtop a leak, is to fill it

it with a plug wrapt in oakam and well tarred, or putting in a tar-pawling clout, to keep the water out; or nailing a piece of ſheet-lead upon the place.

LEAKAGE, the ſtate of a veſſel that leaks, or lets water, or other liquid, ouze in or out. See the preceding article.

Leakage, in commerce, is an allowance of 12 *per cent.* in the cuſtoms, allowed to importers of wines for the waſte and damage it is ſuppoſed to have received in the paſſage: an allowance of two barrels in twenty-two is alſo made to the brewers of ale and beer, by the exciſe-office.

LEAOTUNG, the moſt northerly part of China, in Aſia. See CHINA.

LEAP, *ſalto*, in muſic, is when the ſong does not proceed by conjoint degrees, as when between each note there is an interval of a third, fourth, fifth, &c. See the articles DEGREE and CONJOINT.

It is to be obſerved, that there are two kinds of leaps; the regular leaps and the irregular ones. Regular leaps, are thoſe of a third major or minor, whether natural or accidental, fourth, fifth, ſixth, minor and octave, and theſe either aſcending or deſcending. Irregular leaps, are the tritone, ſixth major, ſeventh major, the ninth, tenth, and, in general, all beyond the compaſs of an octave, unleſs it be for inſtruments.

Beſides theſe, there are ſome that may be uſed with diſcretion, as the fourth diminiſhed, the fifth falſe or defective, and flat ſeventh; but moſtly deſcending, very ſeldom riſing. In effect, all the difference between the regular and irregular leap, is, that theſe which are eaſily performed by the voice, without any great ſtruggle or effort, are regular, as the contrary are irregular. Theſe laſt ſhould be very ſeldom uſed in a ſong, unleſs there is a ſilence between them long enough to weaken the idea of the firſt ſound before the ſecond be heard.

LEAP-YEAR, the ſame with biſſextile. See the article BISSEXTILE.

Every centeſimal, or hundredth year, is a leap-year, according to the Julian account, but according to the gregorian, it is always a common year, except when the number of centuries can be divided by 4 without a remainder, for then it is a leap-year; but the intermediate centeſimal years are common ones: hence, to know if it be leap-year, the rule is, If the year conſiſts of complete centuries, and can be divided by 4, it is leap-year; as it is alſo, when the intermediate years can be divided by 4: thus the year 1756 was a leap-year; for 56 may be divided by 4, without a remainder. If the intermediate years cannot be divided by 4, the remainder ſhews the number of years over leap-year.

LEARMOUTH, a market-town of Northumberland, ſituated forty-eight miles north-weſt of Newcaſtle, and twelve ſouth-weſt of Berwick.

LEASE, in law, a demiſe or letting of lands, tenements, or hereditaments unto another for life, term of years, or at will, for a rent reſerved.

All eſtates, or terms for years, in lands, &c. which are not reduced into writing and ſigned by the parties, ſhall have no greater effect than as eſtates at will, unleſs it be leaſes of terms not exceeding three years from the making. In caſe the ſubſtance of a leaſe that exceeds three years be put in writing, and ſigned by the parties, though ſuch a leaſe be not ſealed, it will have the effect of a leaſe for years. If articles of agreement are made with covenants to make a leaſe for a certain term under a particular rent reſerved, this ſeems to imply a leaſe, and has been ſo adjudged. The words, *to have and poſſeſs lands*, in conſideration of a yearly rent, will make a leaſe of the land; alſo a licence to occupy and take the profits, &c. amounts to a leaſe. A huſband may make ſuch leaſes of lands held in tail in the right of his wife, provided that ſhe be made a party thereto. Where a perſon has an eſtate for life, he is at liberty to grant a leaſe during ſuch eſtate. One intereſted in lands, &c. for a term of years, may make a leaſe of all the years except one day, or other ſhort part of the term: for it muſt be granted for a leſs time than the leſſor has in the lands, otherwiſe it will be an aſſignment. By the common law, a leaſe for life cannot be made ſo as to commence in futuro, for this reaſon, that livery cannot be made to a future eſtate, though a leaſe for term of years may begin either on a day paſt or to come, as at Michaelmas laſt, or Chriſtmas next, &c.

LEASE and RELEASE, as uſed in our law, ſignifies a certain inſtrument in writing, for the conveyance of a right or intereſt in lands and tenements in fee to another. In the making of this conveyance, a leaſe or bargain and ſale for a year, bearing date the next day before the date of the releaſe, is firſt executed, to the intent that

by virtue thereof, and of the ſtatute made for transferring of uſes into poſſeſſion, the leſſee may be in the actual poſſeſſion of the lands, &c. intended to be granted by the releaſe, and to be thereby enabled to take a grant of the reverſion and inheritance of the ſaid lands, &c. to him, his heirs and aſſigns for ever: after which the releaſe muſt be executed, reciting the leaſe or bargain and ſale, and declaring the uſe.

A releaſe made by a perſon, that at the time of the making thereof had no right to the lands, is void in law; as it is likewiſe when made to a man who at the time of its making hath nothing in the lands; for he ought to have either a freehold therein, or a poſſeſſion or privity.

A leaſe and releaſe being only in the nature of one deed, make but one conveyance.

The releaſe conſiſts of the following principal parts, *viz.* the names of the parties, their places of abode, and their additions; the conſideration and granting part, with the particulars of what is granted; the habendum, or explanatory clauſe, ſhewing what intereſt is granted, to whom, and for what uſe: then a covenant that the releaſor is lawful owner, is ſeized in fee, and hath a good right to grant, &c.

LEASH, among ſportſmen, denotes three creatures of any kind; but chiefly greyhounds, foxes, bucks and hares.

The term leaſh alſo ſignifies a line to hold in a hunting dog; and a ſmall long thong of leather, by which a falconer holds his hawk.

LEATHER, the ſkin of ſeveral ſorts of beaſts dreſſed and prepared for the uſe of the various manufacturers, whoſe buſineſs it is to make them up. The butcher and others, who flay off their hides or ſkin, diſpoſe of them raw or ſalted to the tanner and tawyer, and they to the ſhamoy, morocco, and other kind of leather-dreſſers, who prepare them according to their reſpective arts, in order to diſpoſe of them among the curriers, glovers, harneſs-makers, coach-makers, ſaddlers, breeches-makers, gilt leather-makers, chair-makers, ſhoe-makers, book-binders, and all in any way concerned in the article of leather.

The three principal aſſortments of leather are tanned or tawed, and oil and alum-leather; and it may be affirmed, with great truth, that the ſkins of our own production, and thoſe imported from our colonies, when dreſſed in this kingdom, make the beſt leather in the world, and that therefore this is an article of great importance to the trade of the nation.

Though there is no little difference between the dreſſing of ſhamoy-leather, alum-leather, hungary leather, morocco leather, parchment, and tanning; yet the ſkins which paſs through the hands of theſe ſeveral workmen, ought to have been for the moſt part, at leaſt, waſhed clean from blood and impurities in a running water; ſet to drain, worked with the hands, or pounded with wooden peſtles in a vat; put into the pit (which is a hole lined either with wood, or with ſtone and mortar) filled with water in which quick-lime is diſſolved, in order to looſen the hair, that it may be eaſily rubbed off without injuring the ſkin; drawn out, and ſet to drain on the edge of the pit; ſtretched on the leg or horſe, in order to have the hair ſcraped off with a blunt iron-knife, or wooden cylinder; the membranes on the fleſhy ſide, and the ſcabs or roughneſs on the grain-ſide, pared off with a ſharp knife, and the ſkins rubbed with a whetſtone, to take off any particles of the lime, or any thing elſe that may occaſion hardneſs; thickened by different ſorts of powder, whereby they become greater in bulk, and ſo much lighter, as gradually to riſe to the ſurface of the water; ſtretched out green or half dried, and piled one over another; or put up ſeparate after they are dried, and hung out to air upon poles, lines, or any other way: which muſt be repeatedly done in the dreſſing of ſmall ſkins. This alternate tranſition from the liquid of the air into that of water, and from water into the air, with the aſſiſtance of lime, ſalts, and oils, opens the inmoſt fibres of the ſkin ſo effectually, as greatly to facilitate the introduction of ſubſtances proper for making them pliant without rendering them thinner.

The alum leather-dreſſer dreſſes all ſorts of white leather from the ox-hide to the lamb ſkin; for dreſſing the ſadler's leather, he uſes bran, ſea-ſalt, and alum; and for that which the glover uſes, after the common preparatives, he firſt employs bran, and then with ſalt, alum, fine flower, and yolks of eggs mixed in hot water, he makes a ſort of pap, with which the ſkins are ſmeared in a trough.

The ſhamoy leather-dreſſer ſoaks in oil, not only the ſkins of the true ſhamoy, which

which is a wild goat, but likewiſe thoſe of all other goats. The tanner uſes the bark of young oaks ground in a tanning mill, in which he ſoaks the ſkins more or leſs, according to the different ſervices expected from them, their chief uſe being to remain firm and keep out water. In certain caſes, inſtead of tan, he uſes redon, which is chiefly uſed for tanning ram, ſheep-ſkins, and dreſſing ruſſia leather. But for the different methods in which the tanner, currier, ruſſia and morocco leather-dreſſers proceed in finiſhing their ſkins, ſee the articles CURRYING, TANNING, *&c.* and for the duties on leather and ſkins, ſee the articles EXCISE, FURR, *&c.*

Colouring of LEATHER. To colour white leather, the beſt way. Hang the ſkins in chalk or lime-water, till they are grown ſupple, that the hair or wool may be ſtripped off; ſtretch them on tenters, or by means of lines, and ſmooth them over: then bruſh them over with alum-water very warm, and colour them with the colour you would have them, and dry them in the ſun, or in ſome warm houſe, and they will be uſeful on ſundry occaſions, without any farther trouble.

To colour black-leather the German way. Take of the bark of elder two pounds, of the filings or ruſt of iron the ſame quantity; put them into two gallons of rain-water, and ſtop them up cloſe in a caſk or veſſel, and let them ſtand for the ſpace of two months: then add to that the liquid part of a pound of nut-galls, beaten to powder, and a quarter of a pound of copperas, heating them over the fire, and ſuffering them to ſtand 24 hours after; and then uſe the liquor with a bruſh till the ſkin has taken a fine black.

To colour leather a fair red. Firſt rub the leather well in alum-water, or alum it; boil ſtale urine, ſcum it, till half of it is waſted: then put in an ounce of the fineſt lake, the like quantity of brazil in powder, one ounce of alum, and half an ounce of ſal-armoniac; mix them well, and keep them ſtirring over a gentle fire about two hours, and ſo uſe the liquid part, to colour or tinge the ſkins.

To colour leather of a curious french yellow. Take one part of chalk, and another of wood aſhes, and make of them a good lye; then ſtrain out the fine liquor, and ſet it in a veſſel over the fire, and put into it turmeric in powder, and a little ſaffron; and let it ſimmer, till it becomes pretty thick; then ſet it a cooling, to be uſed as occaſion requires.

To make white leather blue. Take a quart of elder berries, ſtrain out the juice, and boil it with an ounce of powder of alum, and half an ounce of indigo, or ſmalt-blue, and bruſh over the leather with a fine bruſh dipped in it three times, ſuffering it to dry between whiles, and the buſineſs will be effected.

To colour ſpaniſh leather, *&c.* Take that which the Dutch call pomplemelch, warm it, and rub the leather with it; then take of venice tot appelen, and having pounded it ſmall, put a quantity of water to it, and let it ſoften over a gentle fire; then preſs out the water, and rub or waſh out the ſkin in it; repeating the ſame ſeveral times; and after that, take the fineſt ſhoemakers black, and rub the ſkin over with it, having in the melting added a little vitriol or copperas, and letting it dry, take gooſe or hog's greaſe, and with a woollen cloth rub the ſkin over for a good while, where there is a good fire to ſupple it, and afterwards rub it over with your hands, till it diſappear; or inſtead of greaſe, you may uſe linſeed or train-oil, and ſo in caſe of any other colour, according to the colours you deſign.

Dying of LEATHER. To dye leather of a reddiſh colour. Firſt waſh the ſkins in water, and wring them out well, and afterwards wet them with a ſolution of tartar and bay-ſalt in fair water, and wring them out again: then to the former diſſolution add aſhes of crab-ſhells, and rub the ſkins very well with this: afterwards, waſh them in common water, and wring them out; then waſh them with tincture of madder in the ſolution of tartar and alum and the crab-ſhell aſhes: and if they prove not red enough after all, waſh them with the tincture of brazil.

To dye leather of a pure yellow. Take of fine aloes two ounces, of linſeed-oil four pounds; diſſolve or melt them; then ſtrain the liquor, and beſmear the ſkins with it, and being dry, varniſh them over.

To dye ſkins of an orange. Boil fuſtic-berries in alum-water: but for a deep orange, uſe turmeric-root.

To dye leather blue. Boil elder-berries, or dwarf-elder in water; then ſmear or waſh the ſkins with it; wring them out; then boil the berries as before in a ſolution of alum-water, and wet the ſkins in the ſame water once or twice;

dry them, and they will be very blue.

To dye leather of a pure ſky-colour. For each ſkin take indigo one ounce, put it into boiling water, let it ſtand one night; then warm it a little, and with a bruſh-pencil beſmear the ſkin twice over.

To dye leather purple. Diſſolve roch-alum in warm water, wet the ſkins with it, dry them; then boil raſped brazil well in water; let it ſtand to cool: do this three times, and afterwards rub the dye over the ſkins with your hand, and when they are dry, poliſh them.

To dye leather green. Take ſap green and alum-water, of each a ſufficient quantity; mix and boil them a little; if you would have the colour darker, add a little indigo.

Gilding of LEATHER. Take glair of the whites of eggs or gum-water, and, with a bruſh, rub over the leather with either of them; then lay on the gold or ſilver, and letting them dry, burniſh them. See the articles GILDING and BURNISHING.

To dreſs or cover leather with ſilver or gold. Take brown red, grind or move it on a ſtone with a mulier, adding water and chalk, and when the latter is diſſolved, rub or lightly dawb the leather over with it, till it looks a little whitiſh, and then lay on the leaf, ſilver or gold, before the leather is quite dry, laying the leaves a little over each other, that there may not be the leaſt part uncovered; and when they have well cloſed with the leather, and are ſufficiently dried on, and hardened, rub them over with an ivory poliſher, or the fore-tooth of a horſe.

For the duties on LEATHER, ſee the articles HIDES, SKINS, *&c.*

LEAVEN, a piece of ſour dough, uſed to ferment and render light a much larger quantity of dough or paſte.

LEAVER, or LEVER, in medicine. See the article LEVER.

LEBUS, a town of Germany, in the marquiſate of Brandenburg, ſituated on the river Oder: eaſt long. 15°, north lat. 52° 30′.

LECCIE, a city of Italy, in the kingdom of Naples, and territory of Otranto: eaſt long. 19°, north lat. 40° 32′.

LECCO, a town of Italy, in the dutchy of Milan: eaſt long. 9° 40′, north lat. 45° 45′.

LECH, a river of Germany, which riſes in Tyrol, and running north, divides Swabia from Bavaria, and having paſſed by Landſprug and Augſburg, falls into the Danube below Donawert.

LECH is alſo a river of Holland, which runs from eaſt to weſt through the provinces of Gelderland and Utrecht, and uniting with the waters of the Maes, falls into the German ſea, near the city of Briel.

LECHEA, in botany, a genus of the triandria-monogynia claſs of plants, the calyx of which is a three-leaſed perianthium: the leaves are concave, patent and permanent; the corolla conſiſts of three oblong leaves, narrower than the cup; the fruit is an oval, three-cornered capſule, compoſed of three valves, and containing three cells, in which is a ſingle oval ſeed.

LECHIA, in ichthyology, the ſcomber, with two fins on the back, and the laſt ray on the hinder fin very long. See the article SCOMBER.

LECHLADE, a market-town of Glouceſterſhire, ten miles eaſt of Cirenceſter.

LECHNICH, a town of Germany, in the circle of the Lower Rhine, and electorate of Cologn: eaſt long. 6° 35′, north lat. 50° 40′.

LECLUSE, a town of the french Netherlands, in the province of Flanders, five miles ſouth of Doway: eaſt long. 3°, north lat. 50° 20′.

LECTICA, in roman antiquity, a vehicle in which people were carried in a reclining poſture.

LECTISTERNIUM, a religious feaſt or banquet of the antient Romans. In times of public danger or calamity, or of thankſgiving for ſome happy event, the republic ordered ſolemn feaſts to be made for the gods; and this ſolemnity was called lectiſternium, becauſe on this occaſion they ſpread tables, and placed beds around them, on which their heavenly gueſts were to lie and eat. Theſe beds were placed near the altars; they were ſtrewed with leaves and odoriferous herbs; cuſhions were laid for the gods to reſt their heads upon, and their ſtatues laid upon theſe beds as if they were to partake of the feaſt: while the goddeſſes were placed in chairs, after the manner of the roman ladies. During the time this religious ceremony laſted, the Romans crowded to the temples; and the ſenators, preceded by the pontifex maximus, came to the place where the ceremony was performed, with crowns on their heads, ſinging hymns in praiſe of the gods, whoſe ſtatues were carried in triumph

umph in chariots and on biers, accompanied with muſic.

ECTOUR, a city of France, in the province of Gaſcony: eaſt long. 25′, north lat. 44°.

ECTURERS, in England, are an order of preachers in pariſh-churches, diſtinct from the rector or vicar. They are choſen by the veſtry, or chief inhabitants of the pariſh, and are uſually the afternoon preachers.

The law requires, that they have the approbation and admiſſion of the ordinary, and that at the time of their admiſſion, they ſubſcribe to the thirty-nine articles of religion, *&c.* required by the ſtatute, 14 Car. II. and they are to be licenſed by the biſhop, like other miniſters.

Where there are lectures founded by the donations of pious perſons, the lecturers are appointed by the founders, without any interpoſition or conſent of rectors of churches, *&c.* though with the leave and approbation of the biſhop; ſuch as that of lady Moyer, at St. Paul's.

EDBURY, a market-town of Herefordſhire, thirteen miles eaſt of Hereford.

EDESMA, a town of Spain, in the province of Leon, ſituated on the river Tormes, eighteen miles weſt of Salamanca: weſt long. 6° 35′, north lat. 41° 15′.

EDGES, in a ſhip, are ſmall pieces of timber lying a-thwart from the waſte-trees to the roof trees: they ſerve to bear up the gratings or nettings over the half-deck. See the article SHIP.

EDGER, the principal book wherein merchants enter their accounts. See the article BOOK.

EDUM, the MARSH-CISTUS, in botany, a genus of the decandria-monogynia claſs of plants, the corolla whereof conſiſts of five hollow, patent, oval petals; the fruit is a roundiſh capſule, containing five cells and opening in five places at the baſe; the ſeeds are numerous, oblong, narrow-pointed at each end, and very ſlender.

EE, in the ſea-language, a word of various ſignifications; though it is generally underſtood, to mean the part oppoſite to the wind. Thus *lee-ſhore*, is that ſhore againſt which the wind blows. *Lee-latch*, or have a care of the lee-latch, is, take care that the ſhip don't go to the leeward, or too near the ſhore. *A lee the helm*, put it to the leeward ſide of the ſhip. *To lie by the lee*, or to come up to the lee, is to bring the ſhip ſo, that all her ſails may lie flat againſt her maſts and ſhrouds, and that the wind may come right upon her broad-ſide.

LEE-FANG, is a rope reeved into the cringles of the courſes, to hale in the bottom of the ſail, that the bonnets may be laced on, or the ſail taken in.

LEE-WAY, is the angle that the rhumb-line, upon which the ſhip endeavours to ſail, makes with the rhumb upon which ſhe really ſails.

This is occaſioned by the force of the wind, or ſurge of the ſea, when ſhe lies to the windward, or is cloſe hawled; which cauſes her to fall off and glide ſide-ways from the point of the compaſs ſhe capes at. Thus, let NESW (plate CLV. fig. 2. n° 1.) repreſent the compaſs, and ſuppoſe a ſhip at C capes at, or endeavours to ſail upon the rhumb C *a*, but by the force of the wind and ſurge of the ſea ſhe is obliged to fall off, and make her way good upon the rhumb C *b*; then the angle *a* C *b* is the lee-way: and if that angle be equal to one point, the ſhip is ſaid to make one point lee-way; or if equal to two points, the ſhip is ſaid to make two points lee-way, *&c.*

The quantity of this angle is very uncertain; becauſe ſome ſhips, with the ſame quantity of ſail, and with the ſame gale, will make more lee-way than others; it depending much upon the mould and trim of the ſhip, and the quantity of water that ſhe draws. However, the common allowances made for lee-way, are theſe: 1. If the ſhip be cloſe hauled, has all her ſails ſet, the water ſmooth, and a moderate gale of wind, ſhe is ſuppoſed to make little or no lee-way. 2. If it blow ſo freſh, as to cauſe the ſmall ſails to be handed, it is uſual to allow one point. 3. If it blow ſo hard, that the tops muſt be cloſe reeft, the ſhip then makes about two points lee-way. 4. If one topſail muſt be handed, it is common to allow two and three quarters or three points lee-way. 5. When both topſails muſt be handed, they allow about four points lee-way. 6. When it blows ſo hard, as to occaſion the fore-courſe to be handed, the allowance is between five and a half and ſix points. 7. When both main and fore courſes muſt be handed, then ſix or ſix and a half points muſt be allowed for her lee-way. 8. When the mizzen is handed, and the ſhip is trying a hull, ſhe then makes her way good about one point before the beam, that is, about ſeven points lee-way.

Though theſe rules are ſuch as are gene-

rally uſed, yet as the lee-way depends much upon the mould and trim of the ſhip, we ſhall here give the method of aſcertaining it by obſervation: thus let the ſhip's wake be ſet by a compaſs in the poop, and the oppoſite rhumb is the true courſe made good by the ſhip; then the difference between this and the courſe given by the compaſs in the bittacle, is the lee-way required. If the ſhip be within ſight of land, the lee-way may be exactly found by obſerving a point on the land which continues to bear the ſame way; for the diſtance between the point of the compaſs it lies on, and the point the ſhip capes at, will be the lee-way. Thus, ſuppoſe a ſhip at C (*ibid.* n° 2.) is lying up N*b*W, towards A; but inſtead of keeping that courſe ſhe is carried on the NNE line CB, and conſequently the point B continues to bear always the ſame way from the ſhip: here it is evident, that the angle ACB, or the diſtance between the N*b*W line that the ſhip capes at, and the NNE line that the ſhip really ſails upon, will be the lee-way. See the articles COMPASS, COURSE, JOURNAL, *&c.*

LEECH, *hirudo*, in zoology. See the article HIRUDO.

Leeches, uſed for bleeding, ſhould be choſen from clear and running waters, for thoſe from ſtagnant ones, and dirty ponds, ſeem to have ſomething malignant in the bite. The ſurgeons uſually chooſe ſuch as have ſlender heads, green lines on their backs, and bellies of a reddiſh yellow. But from whatever waters theſe creatures have been taken, the beſt method is to keep them many days in a glaſs of water, changing it often, that they may cleanſe themſelves. Before the leech is applied to the ſkin, it ſhould be taken out of the water, and kept an hour in an empty cup, to drain itſelf, that it may thus be rendered thirſty and empty. The ſkin too muſt be well rubbed, till it become hot and red, and then either hold the leech by the tail to the part, or let it crawl of itſelf out of the cup upon it. By this means they readily lay hold; but if they refuſe, the blood of a chicken or pigeon ſhould be rubbed on the part; and if that does not allure them, they muſt be laid aſide as uſeleſs, and others taken in their ſtead. They may be properly applied to the temples, or behind the ears, in diſorders of the head, and to the veins of the rectum in the blind piles. And applied to this part alſo, they often prove of great ſervice in hæmorrhages at the noſe, or ſpittings of blood, eſpecially when theſe have been occaſioned by a ſtoppage of the uſual diſcharges that way; though where that is not the caſe, they do great ſervice merely by revulſion.

If much blood is required to be drawn, the tails of the leeches may be cut off as they are ſucking, by which means, the blood they have already ſucked will be diſcharged, as well as what they continue to take in; for they will not let go their hold, but continue ſucking as before.

If they do not let go after a ſufficient quantity of blood is drawn, they are not to be pulled off, for that often occaſions tumours and inflammations; but if a little ſalt be ſprinkled on the place, they quit their hold. The orifices ſhould be waſhed with warm wine or water, and they uſually heal of themſelves.

LEEDS, a large market-town in the weſt riding of Yorkſhire, ſituated on the river Aire, twenty miles ſouth-weſt of York: it has a very great woollen trade.

LEEK, a garden-plant, called by botaniſts porrum. See the article PORRUM.

Leeks are commonly ſown along with onions; the onions growing up firſt are pulled up, ſo that the leeks have room to grow to their full ſize.

Great-houſe LEEK, and *tree houſe* LEEK, in botany, the Engliſh names of two different ſpecies of the ſempervivum. See the article SEMPERVIVUM.

LEEK, in geography, a market-town ſixteen miles north of Stafford.

LEER, in glaſs making, a furnace where the veſſels are allowed to cool by degrees. See the article GLASS.

LEERDAM, a town in the province of Holland, ſeventeen miles north-eaſt of Dort: eaſt long. 5°, north lat. 51° 50′.

LEERWICK, a town of Scotland, in Main-land, one of the iſlands of Shetland, in the county of Orkney: weſt long. 30′, north lat. 61° 20′.

LEES, according to Boerhaave, are the more groſs and ponderous parts of liquors, which, being ſeparated by fermentation, fall to the bottom.

If this feculent matter be dried, and afterwards burnt in a naked fire, it affords ſaline aſhes, from whence a fixed and ſomewhat or even truly alkaline ſalt may be obtained; whence it is evident, that the moſt perfect fermentation cannot volatilize that matter of vegetables, which

is fixed by burning in the fire. See the article FERMENTATION.

A ſpirit of a very agreeable flavour is obtained, by the common proceſs of diſtillation, from wine lees; and as this flavour depends greatly on the eſſential oil of the lees, care ſhould be taken to bring it over with the ſpirit. In order to this, the ſolid lees muſt be ſteeped in ſix or eight times their own weight of water, and well ſtirred at times, before it is put into the ſtill. See DISTILLATION.

LEET, *leta*, a little court held within a manor, and called the king's court, on account, that its authority to puniſh offences originally belonged to the crown, from whence it is derived to inferior perſons. See the article COURT-LEET.

LEETCH *of a ſail*, is the outward edge or ſkirt of the ſail from the earing to the clew; or the middle of the ſail, between the earing and the clew.

LEETCH-LINES, ſmall ropes made faſt to the leetch of the topſails, to which they belong, and reeved into a block at the yard cloſe by the topſail-ties. They ſerve to hale in the leetch of the ſail when the topſails are to be taken in.

LEEWARD, at ſea, the ſide oppoſite to that on which the wind blows. See the article LEE.

LEEWARD-SHIP, one that makes a great deal of lee way. See LEE-WAY.

LEEWARD-ISLANDS, in America, a name given to the Caribbees.

LEG, *crus*, in anatomy, the whole lower extremity from the acetabula of the oſſa innominata, commonly divided into three parts, *viz.* the thigh, the leg properly ſo called, and the foot. See the articles THIGH and FOOT.

The leg conſiſts of three bones, the tibia, fibula, and rotula; or, as it is otherwiſe called, the patella. See the articles TIBIA, FIBULA, *&c.*

For the arteries, veins, nerves, and muſcles of the leg, ſee the articles ARTERY, NERVE, VEIN, and MUSCLE.

LEGACY, ſignifies any thing that is particularly given or bequeathed by a laſt will and teſtament. See the articles WILL and TESTAMENT.

The perſon to whom ſuch a legacy is left, is termed the legatee. There is a reſiduary legatee, or one to whom, after ſeveral deviſes or bequeſts made by will, the reſidue of the teſtator's eſtate and effects are given. See DEVISE.

On a deviſe of a ſum of money to be paid a perſon at the age of twenty-one years, or on the day of marriage, if the legatee die before either of theſe happen, his adminiſtrator ſhall have the legacy. See the article ADMINISTRATOR.

If a legacy is bequeathed, and no certain time of payment mentioned, and the legatee is an infant, he ſhall be intitled to intereſt for his legacy from the expiration of a year after the death of the teſtator, which time is allowed an executor to ſee whether there be any debts; but it is otherwiſe when the legatee is of full age, in ſuch a caſe he ſhall not have any intereſt, but from the time of the demand of the legacy; and if the legacy given is payable at a certain day, it muſt be paid with intereſt from that day.

LEGATE, a cardinal or biſhop, whom the pope ſends as his embaſſador to ſovereign princes. See EMBASSADOR.

There are three kinds of legates, *viz.* legates a latere, legates de latere, and legates by office, or legati nati: of theſe the moſt conſiderable are the legates a latere, the next are the legates de latere. See the article LATERE.

Legates by office are thoſe who have not any particular legation given them, but who by virtue of their dignity and rank in the church, become legates: ſuch are the archbiſhop of Rheims and Arles: but the authority of theſe legates is much inferior to that of the legates a latere.

The power of a legate is ſometimes given without the title. Some of the nuncios are inveſted with it. It was one of the eccleſiaſtical privileges of England from the norman conqueſt, that no foreign legate ſhould be obtruded upon the Engliſh, unleſs the king ſhould deſire it upon ſome extraordinary emergency, as when a caſe was too difficult for the engliſh prelates to determine.

LEGATUS, in roman antiquity, a military officer who commanded as deputy of the chief general. The deſign of the legati at their firſt inſtitution, was not ſo much to command as to adviſe. They were choſen by the conſuls, the authority of the ſenate concurring with their nomination. There were two kinds of legati, *viz.* a legatus in the army, under the imperator or general, who commanded in chief under him, and managed all affairs by his permiſſion; and a legatus in the provinces, under the proconſul or governor, in whoſe abſence the legatus had the honour to uſe the faſces, and was intruſted with the ſame charge as the officer he repreſented. As to the number

ber of the legati we have no certainty, but may ſuppoſe that this depended upon the pleaſure of the general, *&c.* Under the emperors, there were two ſorts of legati, conſulares and prætorii; the firſt of whom commanded whole armies, as the emperor's lieutenant-generals; and the others, only particular legions.

LEGEND, any idle or ridiculous ſtory told by the romaniſts concerning their ſaints, and other perſons, in order to ſupport the credit of their religion.

The legend was originally a book uſed in the old romiſh churches, containing the leſſons to be read at divine ſervice: hence the lives of the ſaints and martyrs came to be called legends, becauſe chapters were read out of them at matins, and in the refectories of religious houſes.

Among theſe the golden legend, which is a collection of the lives of the ſaints, was received by the church with great applauſe, which it maintained for two hundred years; though it is ſo full of ridiculous and romantic ſtories, that the romaniſts themſelves are now aſhamed of it.

But beſides theſe written legends, there are others which may be called traditionary: theſe are thoſe idle ſtories with which every traveller is entertained in his paſſage through popiſh countries. Thus at Mentz, in Germany, they relate, that a drunken man ſwore that he would kill the firſt man he met, and a crucifix coming by, he ſtruck at it with his ſword, which drew blood from the crucifix; and to heighten the wonder, they add, the fellow immediately ſunk up to the knees in the ground, where he ſtood till he was apprehended by the magiſtrates.

LEGER-LINE, in muſic, one added to the ſtaff of five lines, when the aſcending or deſcending notes run very high or low: there are ſometimes many of theſe lines both above and below the ſtaff, to the number of four or five.

LEGGIARDO, or LEGGIARDAMENTE, in muſic, ſignifies to play or ſing in a lively, briſk, and gay manner.

LEGHORN, or LIVORNO, a port-town of Italy, in the dutchy of Tuſcany, ſituated on the Tuſcan ſea, forty miles weſt of Florence: eaſt long. 11°, north lat. 43° 30′.

LEGION, in roman antiquity, a body of foot which conſiſted of ten cohorts.

The exact number contained in a legion, was fixed by Romulus at three thouſand; though Plutarch aſſures us, that after the reception of the Sabines into Rome, he encreaſed it to ſix thouſand. The common number afterwards, in the firſt times of the free ſtate, was four thouſand; but in the war with Hannibal, it aroſe to five thouſand, and after this it is probable that it ſunk again to four thouſand, or four thouſand two hundred, which was the number in the time of Polybius.

They borrowed their names from the order in which they were raiſed, as prima, ſecunda, tertia; but becauſe it uſually happened that there were ſeveral primæ, ſecundæ, *&c.* in ſeveral places, they, on that account, took a ſort of ſurname beſides, either from the emperors who firſt conſtituted them, as Auguſta, Claudiana, Galbiana; or from the provinces which had been conquered chiefly by their valour, as Parthica, Scythica, Gallica, *&c.* or from the names of the particular deities, for whom their commanders had an eſpecial honour, as Minervia and Apollinaris; or from the region where they had their quarters, as Cretenſis, Cyrenaica, Britannica, *&c.* or ſometimes upon account of leſſer accidents, as Adjutrix, Martia, Fulminatrix, Rapax, *&c.* See COHORT, MANIPULUS, *&c.*

LEGISLATOR, a law-giver, or perſon who eſtabliſhes the polity and laws of a ſtate. Such was Moſes, among the Jews; Lycurgus, among the Lacedæmonians, *&c.*

With us, the legiſlative power is lodged in the king, lords, and commons aſſembled in parliament. See PARLIAMENT.

LEGITIMATION, an act whereby illegitimate children are rendered legitimate. See the article BASTARD.

LEGUME, *legumen*, among botaniſts, denotes a pericarpium of an oblong compreſſed figure, formed of two valves, joined by a viſible ſuture both on the upper and under parts, and having the ſeeds affixed to the upper limbs of the two valves, in an alternate order.

LEGUMINOUS, an appellation given to all plants whoſe fruit is a legume. See the preceding article.

LEICESTER, the county-town of Leiceſterſhire, ſends two members to parliament: weſt long. 1° 5′, and north lat. 52° 40′.

LEIGH, a market-town thirty-two miles ſouth-eaſt of Lancaſter.

LEIGHTON BUZZARD, a market-town of Bedfordſhire, fifteen miles ſouth of Bedford.

LEIN-

LEININGEN, a town of Germany, seventeen miles south of Worms.

LEINSTER, a province of Ireland, the capital of which is Dublin.

LEIPSIC, a rich and populous city of Germany, in the circle of Upper Saxony, and province of Misnia: east long. 12° 40′, north lat. 51° 20′.

LEITH, a port-town of Scotland, about two miles north of Edinburgh.

LEMBURG, LEOPOLIS, a city of Poland, and capital of the provence of Red Russia: east long. 24°, north lat. 49°.

LEMGOW, a town of Westphalia, twenty miles north of Paderborne.

LEMING, in zoology, the short-tailed mus, with the body variegated with black and tawney, being the same with the Norway-rat. See NORWAY and MUS.

LEMMA, in mathematics, a proposition which serves previously to prepare the way for the more easy apprehension of the demonstration of some theorem, or construction of some problem.

LEMNA, DUCKWEED, in botany, a genus of the cryptogamia class of plants, producing distinct hermaphrodite and female flowers; neither of which have any flower petals: the stamina are two subulated filaments; and the fruit is a globose, unilocular capsule.

LEMNOS, an island of the Archipelago, situated forty miles south-west of the entrance of the Hellespont: east long. 26°, north lat. 29°.

It is remarkable for producing the bole called lemnian earth, which is a good astringent and vulnerary. See BOLE.

LEMON, *limon*, in botany, a tree comprehended by Linnæus among the citrons. See the article CITRUS.

The medicinal virtues of lemons are the same with those of oranges, only in a greater degree. See ORANGE.

LEMONADE, a liquor prepared of water, sugar, and lemon or citron juice: it is very cooling and grateful.

LEMSTER, a borough-town of Herefordshire, twelve miles north of Hereford.

LEMURIA, a festival of the antient Romans, solemnized on the ninth of May, to pacify the manes of the dead, who were the lemures or phantoms that came in the night to torment the living. The chief ceremony of this festival was as follows: about midnight, the person who offered it, being barefooted, made a signal, by joining the fingers of his hand to his thumb, which he fancied kept off the bad spirit or phantom: he then washed his hands in spring-water, and putting black beans into his mouth, threw them behind him, uttering these words, *I deliver myself and mine by these beans*: he then made a great noise with brass-kettles and pans, desiring the ghost nine times to depart from his house; with which the ceremony ended. The celebration of the lemuria lasted three nights, during which time the temples of the gods were shut up, and no marriages were allowed to be celebrated.

The institution of this festival is ascribed to Romulus, who, to rid himself of the ghost of his brother Remus, which was perpetually appearing to him, ordained a feast to pacify it; whence it is likewise called remuria.

LENA, a great river of Siberia, running north from north lat. 55° to 72°.

LENÆA, Ληναία, in antiquity, a festival of Bacchus, surnamed Lenæus from ληνὸς, i. e. a vine-press. Besides the usual ceremonies at feasts sacred to this god, it was remarkable for poetical contentions, and tragedies acted at this time.

LENCICIA, a city of great Poland, seventy miles west of Warsaw.

LENITIVE MEDICINES, among physicians, those of a mild, softening, and relaxing nature, and destitute of all acrimony.

LENS, in dioptrics, properly signifies a small roundish glass, of the figure of a lentil; but is extended to any optic glass, not very thick, which either collects the rays of light into a point, in their passage through it, or disperses them further apart, according to the laws of refraction.

Lenses have various figures, that is, are terminated by various surfaces, from which they acquire various names. Some are plane on one side, and convex on the other, as that marked A, in plate CLV. fig. 3. n° 1. others convex on both sides, as B, *ibid.* both which are ordinarily called convex lenses: though where we speak accurately, the former is called plano-convex. Again, some are plane on one side, and concave on the other, as C, *ibid.* and others are concave on both sides, as D, *ibid.* which are both usually ranked among the concave lenses; tho' when distinguished, the former is called a plano-concave. Others, again, are concave on one side, and convex on the other, as E, *ibid.* which are called convexo-concave, or concavo-convex lenses,

lenſes, according as the one or the other ſurface is more concave, or a portion of a leſs ſphere. It is here to be obſerved, that in every lens terminated in any of the forementioned manners, a right line, G H, perpendicular to the two ſurfaces, is called the axis of the lens; which axis, when both ſurfaces are ſpherical, paſſes through both their centers; but if one of them be plane, it falls perpendicularly upon that, and goes through the center of the other.

For convex lenſes, the laws of their refraction, and their effects depending thereon, are as follow:

A ray of light E G (*ibid.* n° 2.) near the axis and parallel thereto, ſtriking on the plane ſurface of a plano-convex lens, directly oppoſite to the luminous body, after refraction concurs with the axis in the point F; and if C be the center of the convexity, C F will be to C L; that is, the diſtance of the center from the point of concourſe or focus, will be to the diſtance of the center from the convex ſurface in the ratio of the refraction.

For the plane ſurface being directly oppoſed to the luminous body, the ray E G is perpendicular to A B, and therefore will paſs unrefracted to H: thus it ſtrikes on A H B ſtill parallel to the axis; and therefore coming out of a denſer medium into a rarer, will meet the axis of the lens in F, and ſo as that C F will be to C L in the ratio of the ſine of the refracted angle to the ſine of the angle of inclination, as will be demonſtrated under the article REFRACTION.

If then the refraction be out of a glaſs-lens into air, C F : C L : : 3 : 2, and therefore F L = 2 C L. that is, parallel rays near the axis will concur with it at the diſtance of the diameter. Again, if the refraction were out of a water-lens, *i. e.* out of a plano-convex lens filled with water, C F : C L : : 4 : 3, and therefore F L = 3 C L, *i. e.* parallel rays near the axis will concur with it at the diſtance of half the diameter. So that if a lighted candle be placed in the focus of a plano convex lens, that is, in the point F, diſtant from the ſurface of the lens A L B, by the length of the diameter, and from the ſurface of the water lens by half the diameter, its rays after refraction will become parallel. See the article REFRACTION.

If the ray K I (*ibid.* n° 3.) near the axis of a plano-convex lens, and parallel thereto, ſtrike on its convex ſurface A H B, after a double refraction it will meet the axis in F; ſo as that H G will be to G C, and G E to F H in the ratio of the refraction.

For the ray K I, parallel to the axis E G, by virtue of the firſt refraction in I, will tend to the point G, ſo as G H will be to G C in the ratio of the ſine of the angle of inclination to the ſine of the refracted angle: therefore by virtue of the ſecond refraction in L, it will concur with the axis in F, ſo as G D will be to F D in the ratio of the ſine of the refracted angle, to the ſine of the angle of inclination: ſo that the ſemidiameter and thickneſs of the plano-convex lens, with the ratio of refraction, being given, hence ariſes a method of determining the focus of parallel rays ſtriking on the convex ſurface. Hence, if the lens be glaſs, F D = 2 C H $-\frac{2}{3}$ H D. So that if two-thirds of the thickneſs of the lens be inconſiderable (as in practice it uſually happens) parallel rays meet with the axis at the diſtance of the diameter from the lens, even when they ſtrike on the convex ſurface.

So that as to the place of the focus, 'tis the ſame thing whether the plane ſurface or the convex one be turned to a luminary of parallel rays; though it appears both from experience and trigonometrical calculation, that there are more rays united in a leſs ſpace, if the convex ſurface, than if the plane one be turned towards the ſun. If the lens were full of water, F D = 3 C H $-\frac{3}{4}$ H D. Wherefore, if $\frac{3}{4}$ H D be inconſiderable, F D = 3 C H; or if $\frac{1}{4}$ H D be inconſiderable, F H = 3 C H. Parallel and near rays, therefore, are united at the diſtance of half the diameter, if the refraction be in water, even when the convex ſurface is oppoſed to the luminous body. Hence alſo ariſes a method of determining the focus of parallel rays ſtriking on a lens convex on both ſides, the two ſemidiameters and the thickneſs of the lens being given. On theſe principles is founded the ſtructure of refracting burning-glaſſes; the ſun's light and heat being exceedingly augmented in the focus of a lens, whether convex or plano-convex; ſince the rays falling parallel to the axis of the lens are reduced into a much narrower compaſs, ſo that 'tis no wonder they burn ſome bodies, melt others, and produce other extraordinary phænomena.

If a luminous body be placed in the focus behind a lens, whether plano-convex, or convex on both ſides, or whether equally

Fig. 1. LATITUDE.

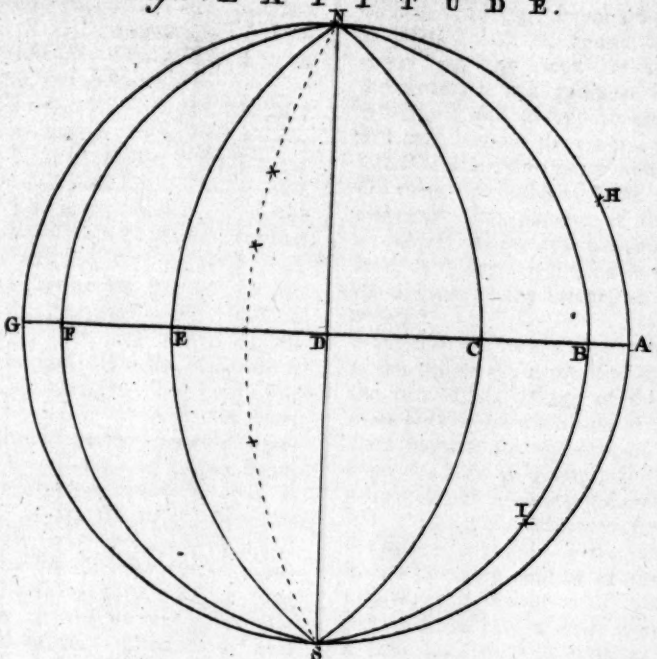


Fig. 2. LEE-WAY.

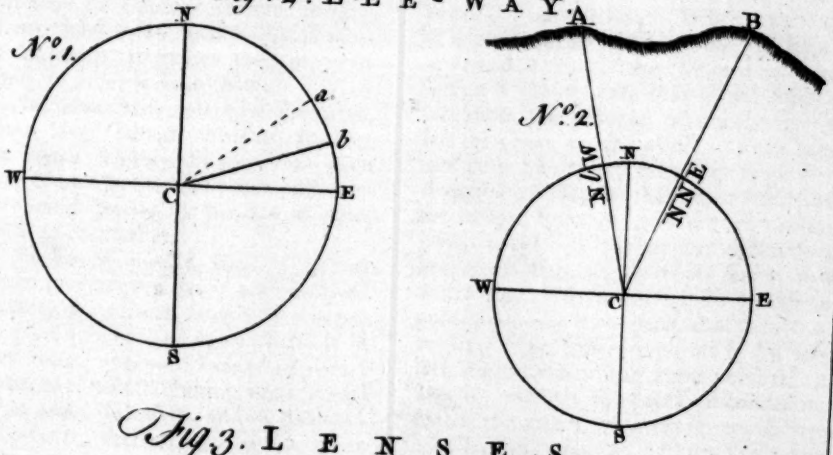
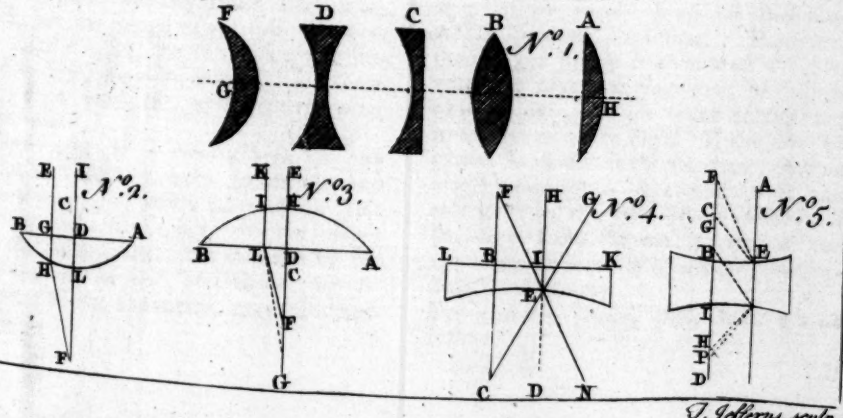


Fig. 3. LENSES.



J. Jefferys sculp.

BRITISH MUSEUM

equally or unequally, the rays after refraction become parallel. Hence by means of a convex lens, or a little glaſs bubble full of water, a very intenſe light may be projected to a vaſt diſtance.

And this furniſhes us with the ſtructure of a lamp or lantern, to project an intenſe light to an immenſe diſtance: for a lens convex on both ſides, being placed oppoſite to a concave mirrour; if in the common focus of both be placed a lighted candle or wick; the rays reflected back from the mirrour to the lens will be parallel to each other, and after refraction will converge, till they arrive at the diſtance of the ſemi-diameter, after which they will again diverge. But the candle being likewiſe in the focus of the lens, the rays it throws on the lens will be parallel: and therefore a very intenſe light, meeting with another equally intenſe, at the diſtance of the diameter from the lens, the light will be ſurprizing; and tho' it afterwards decreaſe, yet the parallel and diverging rays going a long way together, it will be very great at a very great diſtance. Lanterns of this kind are of conſiderable ſervice in the night-time to diſcover remote objects, and are uſed with ſucceſs by fowlers and fiſhermen, to gather their prey together, in order to take them.

If the luminous body, placed in the focus, be of a large extent, the rays flowing from points ſenſibly diſtant from each other, cannot be parallel; but will conſtitute ſeveral trains, or pencils of rays, parallel to each other.

The images of objects, oppoſed in any manner to a convex lens, are exhibited invertedly in its focus. Hence, if a paper be applied to a convex lens (eſpecially in a dark room) at the diſtance of its focus, the images of objects ſhining upon it will be repreſented diſtinctly, and in their natural colours, thereon: nor is the focus of the ſun's rays any thing elſe, in effect, but the image of the ſun. Hence, in ſolar eclipſes, the ſun's image, eclipſed as it is, may be burned by a large lens on a board, &c. a very entertaining phænomenon.

Hence alſo, if a convex lens of any kind be expoſed both to nearer and remoter objects, and a paper at the ſame time applied, ſo as to receive the images of objects diſtinctly, the diſtance of the focus from the lens, and thence the diameter of the convexity, may be determined.

If a concave mirror be ſo placed, as that an inverted image formed by refraction through a lens be found between the center and the focus, or even beyond the center, it will again be inverted by reflection, and ſo appear erect; in the firſt caſe beyond the center, and in the latter between the center and the focus. On theſe principles is built the camera obſcura. The diameter of the image of an object delineated beyond a convex lens, is to the object itſelf in the ratio of the diſtance of the image, to that of the object.

Since then the image of a remoter object is leſs diſtant from the lens than that of the nearer, the image of the more remote will be leſs than that of the nearer. And becauſe the diſtance of the image from the lens is greater, if the lens be a ſegment of a greater ſphere than of a leſs, the image will likewiſe be greater in the former caſe than in the latter. The image therefore will be of ſuch a magnitude, as it would be of, were the object to ſhine into a dark room through a little hole upon a wall, at the ſame diſtance from the hole, at which the focus is from the lens. When an object is leſs diſtant from a lens than the focus of parallel rays, the diſtance of the image is greater than that of the object; otherwiſe the diſtance of the image is leſs than that of the object: in the former caſe, therefore, the image is greater than the object, in the latter leſs. If the images be made greater than the objects, they will not appear diſtinctly; becauſe in that caſe there are fewer rays which meet after refraction in the ſame point: whence it happens, that rays proceeding from different points of an object, terminate in the ſame point of an image, which is the cauſe of confuſion. Hence it appears, that the ſame aperture of a lens may not be admitted in every caſe, if we would keep off the rays which produce confuſion. However, though the image is then moſt diſtinct, when no rays are admitted, but thoſe near the axis, yet for want of rays the image is apt to be dim. If the eye be placed in the focus of a convex lens, an object viewed thro' it appears erect and enlarged, in the ratio of the diſtance of the object from the eye, to that of the eye from the lens, if it be near; but infinitely, if remote.

For concave lenſes, their laws are as follow:

If parallel rays ſtrike on a plano-concave lens K L (*ibid.* n° 4.) and F C be to F B in the ratio of the refraction, the rays will diverge from the axis, and the point of divergency or diſperſion, called the virtual focus, will be F. For the ray H I, parallel to the axis, is perpendicular to K L. and will therefore paſs unrefracted to L. Wherefore F C being to F B in the ratio of refraction, F will be the virtual focus. See FOCUS.

If then the lens be glaſs, F B = 2 B C; *i. e.* the virtual focus F will be diſtant from the lens K L a diameter and a half 3 B C.

If the ray A E, (*ibid.* n° 5.) parallel to the axis F P, ſtrike on a lens concave on both ſides; and both F C be to F B, and I P to P H in the ratio of refraction; and F P : P H : : F B : B G; G will be the point of diſperſion, or the virtual focus. If therefore the refraction be in a glaſs-lens, the ſums of the ſemidiameters C B and H I, will be to the diameter of the concavity of either, 2 H I; as the ſemidiameter of the other, C B, to the diſtance of the virtual focus from the lens B G. Hence the ſun's rays ſtriking on a concave lens, their light after refraction will be conſiderably weakened; ſo that the effect of concave lenſes, is oppoſite to that of convex ones.

Laſtly, an object viewed thro' a concave lens appears erect, and diminiſhed in a ratio compounded of the ratios of the ſpace in the axis, between the point of incidence and the point to which an oblique ray ſhould paſs without refraction, to the ſpace of the axis between the eye and the middle of the object; and the ſpace in the ſame axis between the eye and the point of incidence, to the ſpace between the middle of the object and the point the oblique ray would paſs to without refraction.

Though the properties of lenſes have been conſidered here principally with regard to rays falling near the axis, and parallel thereto; yet the reaſoning will be eaſily transferred to rays more remote from the axis, and falling in any direction. Thus we may ſay univerſally, that in a convex lens all parallel rays become converging, and concur in a focus; that diverging rays either become leſs diverging, or run parallel, or converge; and that converging rays, converge the more: all which alterations are more ſenſible in oblique rays than in perpendicular ones, by reaſon the angles of incidence in that caſe are greater.

In concave lenſes all parallel rays become diverging; diverging rays diverge more; converging rays either converge leſs, or become parallel, or go out diverging: all which things hold of oblique, as well as direct rays, but more ſenſibly in the firſt.

A lens, one of whoſe ſurfaces is convex, and the other concave is called a *meniſcus*. Some confine lenſes within the diameter of five or ſix lines, and will have ſuch as exceed that diameter called lenticular glaſſes.

Lenſes are diſtinguiſhed with regard to their preparation, into ground and blown. Blown lenſes are little globules of glaſs melted in the flame of a lamp or taper; but the figure of theſe is ſeldom exact; beſides that the ſmoke of the lamp cleaves to the ſurface in melting: on both which accounts, they come ſhort of the clearneſs of thoſe which are ground. See the articles GRINDING and POLISHING.

For the method of determining the foci of different lenſes, ſee FOCUS.

LENS is alſo a town of the french Netherlands, eight miles north of Arras.

LENT, a ſolemn time of faſting in the chriſtian church, obſerved as a time of humiliation before Eaſter, the great feſtival of our Saviour's reſurrection.

Thoſe of the romiſh church, and ſome of the proteſtant communion, maintain, that it was always a faſt of forty days, and as ſuch, of apoſtolical inſtitution. Others think it was only of eccleſiaſtical inſtitution, and that it was variouſly obſerved in different churches, and grew by degrees from a faſt of forty hours, to a faſt of forty days. This is the ſentiment of Morton, biſhop Taylor, du Moulin, Daillé, and others.

If this faſt was of apoſtolical inſtitution, it is ſcarce accountable how ſuch a variety in point of time ſhould happen in the obſervation of it; ſome churches keeping it only three weeks, ſome ſix, ſome ſeven, and yet none of them hitting upon the preciſe number of forty days. It is obſervable however, that they all agreed in calling this faſt quadrageſimal, and aſſigned different reaſons for it; and that Aſh-wedneſday, and the other three days were not added by the romiſh church to the beginning of lent, till the ſeventh or eighth century. The manner of obſerving lent among thoſe who were piouſly diſpoſed, was to abſtain from food till evening, their only refreſhment was a ſupper, and then it

was

was indifferent whether it was fleſh or any other food, provided it was uſed with ſobriety and moderation.

Lent was thought the proper time for exerciſing, more abundantly, every ſpecies of charity. Thus what they ſpared from their own bodies by abridging them of a meal, was uſually given to the poor: they employed their vacant hours in viſiting the ſick, and thoſe that were in priſon, in entertaining ſtrangers, and reconciling differences. The imperial laws forbad all proſecution of men in criminal actions, that might bring them to corporal puniſhment and torture, during the whole ſeaſon. This was a time of more than ordinary ſtrictneſs and devotion, and therefore in many of the great churches they had religious aſſemblies for prayer and preaching every day. All public games and ſtage-plays were prohibited at this ſeaſon; as alſo the celebration of all feſtivals, birth-days, and marriages, as unſuitable to the preſent occaſion.

The chriſtians of the greek-church obſerve four lents: the firſt commences on the fifteenth of November, or forty days before Chriſtmas: the ſecond is the ſame with our lent: the third begins the week after Whitſuntide, and continues till the feſtival of St. Peter and St. Paul: and the fourth commences on the firſt of Auguſt, and laſts no longer than till the fifteenth. Theſe lents are obſerved with great ſtrictneſs and auſterity; but on Saturdays and Sundays they indulge themſelves in drinking wine and uſing oil, which are prohibited on other days.

LENTISCUS, the LENTISK-TREE, in botany, belongs to the ſame genus with the piſtachia. See PISTACHIA.

Lentiſk wood is eſteemed aſtringent and balſamic, and accordingly recommended in the fluor albus and gonorrhœa. See FLUOR ALBUS and GONORRHOEA.

LEO, the LION, in zoology. See LION.

LEO, in aſtronomy, one of the twelve ſigns of the zodiac, the fifth in order; containing, according to Ptolemy, thirty-two ſtars; according to Tycho, thirty-ſeven; and, in the britannic Catalogue, there are no leſs than ninety-four.

The ſtar called the lion's heart, cor leonis, regulus, and baſilicus, is a fixed ſtar of the firſt magnitude.

LEO, a town and biſhop's ſee of Italy, twenty miles north-weſt of Urbino.

LEOMINSTER, or LEMSTER, See the article LEMSTER.

LEON, the capital of the province of Leon, in Spain, ſituated on the river Eſla: weſt lon. 6° 5′, north lat. 43°.

LEON is alſo the capital of the province of Nicaragua, in Mexico, ſituated at the weſt end of the Lake Nicaragua: weſt long. 91°, north lat. 11° 30′.

St. LEONARD, a town of France, in the province of Guiennes, and territory of Limoſin: eaſt long. 1° 45′, north lat. 45° 50′.

St. LEONHART, a town of Germany, in the circle of Auſtria, and duchy of Carinthia: eaſt long. 15°, north lat. 47°.

LEONINE VERSES, ſuch as rime at every hemiſtich, the middle ſyllable of each verſe correſponding to the laſt one.

LEONTICE, in botany, a genus of the hexandria-monogynia claſs of plants, the flower of which conſiſts of ſix oval petals; and the fruit is a large, globoſe, anulated and unilocular capſule, containing a few ſeeds of the ſame figure.

LEONTINI, a town of Sicily, twenty miles north-weſt of Syracuſe.

LEONTODON, DANDELION, in botany, a genus of the ſyngeneſia-polygamia claſs of plants, the compound flower of which is imbricated and uniform; and the partial ones, monopetalous and ligulated: the ſtamina are five ſcarcely diſcernible capillary filaments: the ſeed, which is ſolitary, is contained in the cup of each partial flower, or corollula.

Dandelion is ſaid to have much the ſame virtues with endive. See ENDIVE.

LEONURUS, LION'S TAIL, in botany, a genus of the didynamia gymnoſpermia claſs of plants, the flower of which is monopetalous and ringent; and its ſeeds, which are four in number, are contained in the bottom of the cup.

LEOPARD, a beaſt of prey, with the ſpots on the upper part of the body round, and the lower ones virgated. It is a very nimble, as well as fierce animal, ſo that ſcarce any thing eſcapes it.

Authors call the male pardus, and the female panthera.

LEOPARD'S BANE, *doronicum*, in botany. See the article DORONICUM.

LEOPOLSTAT, a city of Upper Hungary, ſubject to the houſe of Auſtria: eaſt long. 18° 6′, north lat. 48° 55′.

LEPANTO, a port-town of european Turky, eighty miles weſt of the iſthmus of Corinth; whence the gulph of Lepanto takes its name.

LEPASTRUM, in natural hiſtory, a genus of ſelenitæ, compoſed of plates diſpoſed

in

in the form of a radiated ſtar. See the article SELENITÆ.

LEPIDIUM, DITTANDER, in botany, a genus of the tetradynamia-ſiliculoſa claſs of plants, with a tetrapetalous cruciform flower: the ſtamina are ſix ſubulated filaments; and the fruit is a compreſſed bilocular pod.

LEPIDOPTERA, in zoology, an order of inſects, with four wings, which are covered with imbricated ſquamulæ: add to this, that the mouth is commonly ſpiral.

Under this order are comprehended the butterflies, and phalenæ, or moths.

LEPIUM, in natural hiſtory, a genus of foſſils of the harder gypſum, compoſed of very ſmall particles, and of a leſs glittering hue. See the article GYPSUM.

There is only one ſpecies of this genus, being one of the leaſt valuable and moſt impure of the claſs of gypſums. It is of an extremely rude, irregular, coarſe and unequal ſtructure; a little ſoft to the touch, of a very dull appearance, and of different degrees of a greyiſh white. It is burnt in plaiſter for the coarſer works; it calcines very ſlowly and unequally, and makes but a very coarſe and ordinary plaiſter.

LEPROSO AMOVENDO, an antient writ for removing a perſon infected with the leproſy, who forced himſelf into the company of his neighbours, either in a church, or at ſome public meeting.

LEPROSY, *lepra*, a foul cutaneous diſeaſe, appearing in dry, white, thin, ſcurfy ſcabs, either on the whole body, or only ſome part of it, and uſually attended with a violent itching and other pains.

The leproſy is ſaid to be of two kinds, that of the Arabians, called elephantiaſis, from the roughneſs, inequalities, and tubercles of the ſkin, reſembling that of an elephant; and that of the Greeks, called impetigo. See ELEPHANTIASIS.

Lucretius ſuppoſed the elephantiaſis to be generated in Egypt, and no where elſe; but if the leproſy of the jews is the ſame as that of the negroes, which is highly probable; then it may be affirmed, that it is endemical to the ſouthern and inland parts of Africa. That it was contagious all hiſtories ſacred and prophane agree. Pliny acquaints us, that it did not invade Italy till the time of Pompey the Great, and that it was brought from Egypt, and is peculiar to that kingdom. Some have thought that the leproſy of the Arabians, or more properly of the Africans, was the parent of the lues venerea: however that be, it is certain, that ſince the pox has been curable, the elephantiaſis ſeems to have diſappeared, and the leproſy of the Greeks has been much leſs frequent than before.

Pliny informs us, that the firſt appearance of the elephantiaſis is in the face, particularly a ſmall ſpeck appears on the noſe or noſtril, and as the diſeaſe increaſes, the whole body is full of ſpots of various colours; the ſkin is thick in one place, and thin in another; hard and rough with ſcabs. In proceſs of time, the ſkin turns black, and eats away the fleſh to the very bones; then the body, Celſus obſerves, falls away, the mouth legs and feet ſwell, and the fingers and toes are hid with a ſwelling; even the bones themſelves do not eſcape: afterwards a fever ariſes, to which the patient falls an eaſy victim.

This leproſy has made great progreſs of late years in Barbadoes, not only among the negroes, but the white inhabitants. Towne ſays, that at firſt there appears ſpots of a brown copper-colour, diſperſed over ſeveral parts of the face, but eſpecially on the noſe, without any uneaſineſs or ſenſe of pain at the beginning: theſe ſpread by ſlow degrees, till a great part of the body is covered with them.

There is another diſeaſe which Towne falſely calls the elephantiaſis, which generally happens after long illneſs, acute fevers, obſtinate intermittents, or other tedious diſtempers: the vitiated humours generally ſubſiding into one leg, ſometimes into both, imitating an anaſarca. As the leg becomes more tumified, the veins are diſtended with various ſwellings from the knee to the toes: then the ſkin begins to grow rugged and unequal, its vaſcular and glandular compages are enlarged, and a ſcaly ſubſtance with a ſort of chaps and fiſſures in the interſtices appear on the ſurface: theſe ſeeming ſcales do not dry up, but are protruded forward, and ſtretched in their dimenſions till the leg is enlarged to an enormous bulk.

Hoffman thinks the ſeat of theſe diſeaſes is in the ſkin, but chiefly the fatty membrane thereof, where the fomes of the impure and corrupt matter chiefly reſides; inſo much that by corroding, pricking, and inflaming the nervous fibrillæ of the ſkin, various kinds of puſtles are generated.

This

This diſeaſe is hereditary and infectious; for it may be caught by the ſaliva of a leper, if a ſound perſon drinks after him, by touch, by lying in the ſame bed, and by coition.

An inveterate leproſy was judged to be abſolutely incurable; but Artæus ſays, when the diſeaſe is new and recent, there are great hopes of a cure. What he and Celſus preſcribe in order to the cure is not worth repeating; for if any medicines will do, they muſt be of the herculean kind. Authors are exceſſive in the praiſe of viper's fleſh, which Hoffman judges to be quite inſignificant. Joel adviſes bleeding, and purging with twelve grains of the extract of black hellebore, or three grains of the glaſs of antimony, in conſerve of roſes: but the vitrum ceratum is more ſafe, and may be given in a larger doſe. Towne confeſſes, that the antimonial preparations yielded moſt relief in Barbadoes, but he could not ſay that they perfected the cure. On the other hand, mercury exaſperated the diſtemper, irritated the ulcers, and made them ſpread the faſter.

The impetigo or leproſy of the Greeks, begins with red pimples or puſtles breaking out in various parts of the body; ſometimes they appear ſingle, ſometimes a great number ariſe together, eſpecially on the arms and legs. As the diſeaſe increaſes, freſh pimples ariſe, which joining the former, make a ſort of cluſter, all which enlarge their borders, and ſpread in an orbicular form. This leproſy, according to Turner, breaks out firſt in the elbows and knees, but ſoon ſpreads farther, and gradually ſhews itſelf over all the body. The cauſes and ſeat of this diſeaſe are ſaid to be the ſame as the former. Willis blames all dried and ſalted meats, eſpecially hog's fleſh, and fiſh, particularly ſhell-fiſh; becauſe the poor people in Cornwal inhabiting near the ſea-coaſt, were formerly much ſubject to leprous diſeaſes, and had many hoſpitals erected on that account.

In the method of cure, ſays Hoffman, we ſhould endeavour to diſcharge out of the body the maſs of corrupt glutinous and acrid humours, by ſufficient bleeding, and abſtinence, by purges, as well gentle as draſtic, then by proper aliment, and a good regimen, promote the generation of wholeſome juices; and likewiſe by external, deterſive, conſolidating and drying remedies, to free the part from pain, tumours, itching, and ulcers. The purges may conſiſt of the root and the reſin of jalap, the extract of black hellebore, elaterium mixt with calomel, or ethiops-mineral, and gum ammoniac. Among thoſe things which ſtimulate the parts to an excretory motion, and more powerfully melt down the tenacious humours, the wood and bark of guaiacum exceed all others: the moſt conſiderable beſides theſe, are the tartarized and acrid tincture of antimony, ſulphur of antimony, cinnabar, and if a venereal taint is ſuſpected, a decoction of crude antimony; which medicines in a convenient doſe in the morning, with purifying decoctions drank in bed, afford great relief. But if theſe fail, recourſe muſt be had to mercury, which ſome, after extinction, mix with flowers of ſulphur and camphire, and rub it on the joints to promote a ſalivation. Others more properly give mercurius dulcis, with double the quantity of crab's-eyes, and calx of antimony, riſing gradually from three or four grains, to a ſcruple, in order to ſalivate with proper precautions. See SALIVATION.

LEPTODECORHOMBES, in natural hiſtory, a genus of foſſils of the order of the ſelenitæ; conſiſting of ten planes, each ſo nearly equal to that oppoſite to it as very much to approach to a decahedral parallelopiped, though never truly or regularly ſo. Two of the planes in this genus, which may properly enough be called the top and bottom are ever broader and flatter than the reſt, and theſe, tho' not regularly equal, uſually anſwer one another very nearly, as alſo do the other eight in two ſets of fours. There are four ſhorter planes meeting in ſomewhat acute angles, two and two, from the ends, or two ſhorter edges of the two flat and broad rhomboidal planes, called the top and bottom; and four longer meeting in more obtuſe angles from the ſides, or longer edges of the ſame rhomboidal planes. As the broader and flatter planes, or the top and bottom, in this genus are not regularly equal to each other, ſo neither are the eight narrower to their oppoſites, but there are uſually differences both in their angles, and in the breadth of them. See the article SELENITÆ.

Of this genus there are only five known ſpecies. 1. A thin, fine, pellucid, and ſlender ſtreaked one, with tranſverſe ſtriæ, found in conſiderable quantities in the ſtrata of clay in moſt parts of England, particularly near Heddington in Oxfordſhire.

ſhire. 2. A thin, dull-looking, opake, and ſlender ſtreaked one, more ſcarce than the former, and found principally in Leiceſterſhire and Staffordſhire. 3. A thin fine ſtreaked one, with longitudinal ſtriæ, found in the clay-pits at Richmond, and generally lying at great depths. This has often on its top and bottom a very elegant ſmaller rhomboide, deſcribed by four regular lines. 4. A rough kind with thick tranſverſe ſtriæ, and a ſcabrous ſurface, very common in Leiceſterſhire and Yorkſhire. And, 5. a very ſhort kind, with thick plates, common in the clay-pits of Northamptonſhire and Yorkſhire.

LEPTOPOLYGINGLIMI, in natural hiſtory, a name which Dr. Hill gives to a genus of foſſil-ſhells, diſtinguiſhed by a number of minute teeth at the cardo; whereof we find great numbers at Harwich-cliff, and in the marle-pits of Suſſex.

LEPTURA, in zoology, a genus of winged inſects, the antennæ whereof are oblong, ſlender and ſetaceous, the exterior wings are truncated at their extremity, and the thorax is of a ſubcylindric figure. See the article INSECTS.

LEPUS, the HARE, in zoology. See HARE.

LEPUS, in aſtronomy, a conſtellation of the ſouthern hemiſphere; comprehending 12 ſtars, according to Ptolemy; 13, according to Tycho; and 19, in the Britannic Catalogue.

LERIA, a city and biſhop's ſee of Portugal: weſt longitude 9° 15′, and north latitude 39° 30′.

LERIDA, a city and biſhop's ſee of Catalonia, in Spain: eaſt longitude 5′, north latitude 41° 20′.

LERINS, two iſlands on the coaſt of Province, five or ſix miles ſouth of Antibes, called St. Margaret and St. Honorat.

LERNEA, the SEA-HARE, in zoology, a ſea-inſect of the order of the gymnarthria, the body of which is of an oblong cylindric figure, and is perforated in the forehead; the tentacula reſemble ears. See the article GYMNARTHRIA.

LE ROY LE VEUT, the king's aſſent to public bills. See the articles BILL, STATUTE, and PARLIAMENT.

LESBOS, or METELIN, an iſland of the Archipelago, ſixty miles north-weſt of Smyrna. Its chief town is Caſtro.

LESCAR, a city and biſhop's ſee of France, forty miles eaſt of Bayonne.

LESKARD, a borough-town of Cornwal, fifteen miles weſt of Launceſton, which ſends two members to parliament.

LESSINES, a town of the Auſtrian Netherlands, fourteen miles north of Mons.

LESSONS, among eccleſiaſtical writers, portions of the holy ſcriptures, read in chriſtian churches, at the time of divine ſervice.

In the antient church, reading the ſcriptures was one part of the ſervice of the catechumens, at which all perſons were allowed to be preſent, in order to obtain inſtruction.

The church of England, in the choice of leſſons, proceeds as follows: for the firſt leſſon on ordinary days, ſhe directs, to begin at the beginning of the year with Geneſis, and ſo continue on, till the books of the Old Teſtament are read over, only omitting the Chronicles, which are for the moſt part the ſame with the books of Samuel and Kings, and other particular chapters in other books, either becauſe they contain names of perſons, places, or other matters leſs profitable to ordinary readers.

The courſe of the firſt leſſons for Sunday is regulated after a different manner. From Advent to Septuageſima-Sunday ſome particular chapters of Iſaiah are appointed to be read, becauſe that book contains the cleareſt prophecies concerning Chriſt. Upon Septuageſima-Sunday Geneſis is begun, becauſe that book which treats of the fall of man, and the ſevere judgment of God inflicted on the world for ſin, beſt ſuits with a time of repentance and mortification. After Geneſis, follow chapters out of the books of the Old Teſtament, as they lie in order; only on feſtival Sundays, ſuch as Eaſter, Whitſunday, &c. the particular hiſtory relating to that day is appointed to be read; and on the Saints-days, the church appoints leſſons out of the moral books, ſuch as Proverbs, Eccleſiaſtes, Eccleſiaſticus, &c. as containing excellent inſtructions for the conduct of life. As to the ſecond leſſons, the church obſerves the ſame courſe both on Sundays and week days: reading the goſpels and Acts of the Apoſtles in the morning, and the epiſtles in the evening, in the order they ſtand in the New Teſtament, excepting on ſaints-days and holy-days, when ſuch leſſons are appointed, as either explain the myſtery, relate the hiſtory, or apply the example to us.

LESSOR, and LESSEE, in law. See LEASE.

LESTWITHIEL, a borough-town of Cornwal

Cornwal, twenty-three miles ſouth-weſt of Launceſton, which ſends two members to parliament.

LET FALL, a word of command at ſea, to put out a ſail when the yard is aloft, and the ſail is to come or fall down from the yard; but, in ſtrictneſs, is only applied to the main and fore-courſes, when their yards are hoiſted up.

LETHARGY, in medicine, a diſeaſe wherein ſuch a profound drowſineſs or ſleepineſs attends the patient, that he can be ſcarce awaked, and, if awaked he remains ſtupid, without ſenſe or memory, and preſently ſinks again into his former ſleep. The lethargy has ſome affinity to the apoplexy and palſy, and often attends them. In theſe ſleepy diſorders, there is ſometimes a fever, and ſometimes none. The immediate cauſe of them is a very languid and diminiſhed influx of the animal ſpirits from the cortical part of the brain into the medulla oblongata, and from thence into the nerves deſtined for ſenſe and motion. See the article APOPLEXY.

There are ſeveral kinds of theſe diſorders, but the principal are a coma vigil, a coma ſomnolentum, a carus, and a lethargy. See COMA VIGIL, COMA SOMNOLENTUM, and CARUS.

A lethargy then, properly ſo called, is attended with a fever, which is a ſymptom thereof, and is chiefly diſcovered by the frequency of the pulſe, whereas a carus is often a ſymptom or conſequence of a fever. It does not invade ſo ſuddenly as an apoplexy. It is never without danger, but that is the worſt which is attended with a tremor of the limbs, and a cold ſweat of the face.

The cauſes of a lethargy are the ſame as of a coma ſomnolentum, but more violent. The cauſe proceeds from an obſtruction of the paſſage of the nervous fluid, from the cortical part to the medulla oblongata, as was already obſerved: ſuch is, 1. Too great a relaxation of the blood-veſſels in the brain, which retards the circulation, and happens to plethoric old men. 2. A difficult circulation of the blood through the head, eſpecially when thick and impure: hence plethoric, ſcorbutic and hypochondriac perſons, are frequently drowſy, eſpecially when there are ſpaſms in the abdomen: hence children troubled with worms are ſleepy, becauſe the blood is forced too plentifully to the head: hence the profound ſleep of plethoric perſons, when intoxicated, may be accounted for, which when cauſed by exceſs of ſpirituous liquors is often fatal. 3. An exceſſive collection of ſerum in the brain, and its membranes, and an extravaſation thereof; the ſuppreſſion of the running of the ears, a coryza and ulcers will cauſe a lethargy, or coma ſomnolentum, and either of them immediately follows a ſuppreſſion of urine.

Among the remote cauſes of theſe diſeaſes may be reckoned a cacochymic, cachectic, and ſcorbutic habit of body; a debility from grief, tedious diſeaſes, great loſs of blood, abuſe of intoxicating liquors, frequent ſurfeits, breathing a denſe vapid air, a moiſt cloudy ſeaſon, weſterly winds, the winter-ſeaſon, and an abuſe of tobacco: likewiſe a ſuppreſſion of the hæmorrhoids, menſes, or any uſual hæmorrhage, or any cuſtomary evacuation, too long an abſence of the gout, and the like, will occaſion theſe diſorders.

In the cure of theſe diſeaſes, ſays Hoffman, three intentions ſhould chiefly be regarded: 1. To raiſe the patient from ſleep. 2. To remove the difficulty of circulation, and the ſtagnation or extravaſation of the blood or ſerum in the head. 3. To reſtore the ſtrength of the membranes and veſſels of the brain. Thoſe remedies are efficacious, in the firſt caſe, which act on the nervous parts, by inducing a tremulous and oſcillatory motion through the whole nervous ſyſtem; ſuch as powerful acids mixed with tincture of caſtor, &c. volatile ſalts, fetid things, as galbanum, burnt partridges feathers, cold water thrown on the head, cataplaſms made with vinegar, rue, bay-leaves, tops of ſavory, muſtard-ſeed, caſtor, and camphire, applied to the head, forehead, and temples. The ſerous colluvies is derived from the head by ſternutatories; the beſt is ten grains of ſalt of white vitriol, diſſolved in half an ounce of marjoram-water, and drawn up the noſe; bliſters on the feet and neck; cupping-glaſſes, either with or without ſcarification; ſtrong frictions on the lower parts; ſtimulating clyſters, with the addition of ſal gem, common ſalt, or the root of ſquills. To remove the ſtagnation, and promote the circulation, if the veſſels are turgid with blood, veneſection is neceſſary; then gentle laxatives and nervous medicines mixed with diaphoretics. A powder made of ſalt of hartſhorn, ſalt of amber, cinnabar of antimony, and bezoar mineral, has very great and ſalutary effects.

But to be more particular: the cure of the coma vigil we have given under that head, as alſo that of the coma ſomnolentum; only it may be farther obſerved, that a coma vigil, which accompanies a hemiplegia, is of longer continuance; and that its cure depends on curing the principal diſorder. In the coma ſomnolentum, a red face, turgid with blood, indicates bleeding. Volatile ſpirits or ſalts ſhould never be applied to the noſe; but when ſleepineſs proceeds from a cold ſerous cauſe, or when an eryſipelas, miliary, or other eruptive matter is tranſlated to the brain, here penetrating acids are uſeful. Sternutatories ſhould not be uſed in the beginning of the diſorder, if the perſon is plethoric, becauſe they occaſion a great afflux of humours to the head, whereby an apoplexy may be occaſioned. A carus, eſpecially the firſt ſpecies of it, requires plentiful bleeding, and the patient muſt be rouſed by clyſters rendered ſtimulating with powder of ſquills; by bliſters, by putting diſtilled vinegar into the noſtrils, and by appeaſing the orgaſm of the fluids, with cooling fixed diaphoretics and acids: the ſecond ſpecies requires but little or no aſſiſtance: and the third is incurable, eſpecially if bliſters fail.

LETHE, in the antient mythology, one of the rivers of hell, ſignifying oblivion or forgetfulneſs; its waters having, according to poetical fiction, the peculiar quality of making thoſe who drank of them entirely forget every thing that was paſt.

LETRIM, or LEITRIM, a county of Ireland, in the province of Connaught; bounded by Fermanagh on the north, by Cavan on the eaſt, by Roſcommon on the ſouth, and by Sligo on the weſt.

LETTER, a character uſed to expreſs one of the ſimple ſounds of the voice; and as the different ſimple ſounds are expreſſed by different letters, theſe, by being differently compounded, become the viſible ſigns or characters of all the modulations and mixtures of ſounds uſed to expreſs our ideas in a regular language. Thus, as by the help of ſpeech, we render our ideas audible; by the aſſiſtance of letters we render them viſible, and by their help we can wrap up our thoughts, and ſend them to the moſt diſtant parts of the earth, and read the tranſactions of different ages. As to the firſt letters, what they were, who firſt invented them, and among what people they were firſt in uſe, there is ſtill room to doubt: Philo attributes this great and noble invention to Abraham; Joſephus, St. Irenæus, and others, to Enoch; Bibliander, to Adam; Euſebius, Clemens Alexandrinus, Cornelius Agrippa, and others, to Moſes; Pomponius Mela, Herodian, Rufus Feſtus, Pliny, Lucan, &c. to the Phœnicians; St. Cyprian, to Saturn; Tacitus, to the Egyptians; ſome, to the Ethiopians; and others, to the Chineſe; but, with reſpect to theſe laſt, they can never be entitled to this honour, ſince all their characters are the ſigns of words, formed without the uſe of letters; which renders it impoſſible to read and write their language, without a vaſt expence of time and trouble; and abſolutely impoſſible to print it by the help of types, or any other manner by the engraving, or cutting in wood. See the article PRINTING.

There have alſo been various conjectures about the different kinds of letters uſed in different languages; thus, according to Crinitus, Moſes invented the hebrew letters; Abraham, the ſyriac and Chaldee; the Phœnicians, thoſe of Attica, brought into Greece by Cadmus, and from thence into Italy, by the Pelaſgians; Nicoſtrata, the roman; Iſis, the egyptian; and Vulfilas, thoſe of the Goths.

It is probable that the egyptian hieroglyphics were the firſt manner of writing; but whether Cadmus and the Phœnicians learned the uſe of letters from the Egyptians, or from their neighbours of Judea or Samaria, is a queſtion; for ſince ſome of the books of the Old Teſtament were then written, they are more likely to have given them the hint, than the hieroglyphics of Egypt. But whereſoever the Phœnicians learned this art, it is generally agreed, that Cadmus, the ſon of Agenor, firſt brought letters into Greece; whence, in following ages, they ſpread over the reſt of Europe.

Letters make the firſt part or elements of grammar; an aſſemblage of theſe compoſe ſyllables and words, and theſe compoſe ſentences. The alphabet of every language conſiſts of a number of letters, which ought each to have a different ſound, figure, and uſe. As the difference of articulate ſounds was intended to expreſs the different ideas of the mind, ſo one letter was originally intended to ſignify only one ſound, and not, as at preſent, to expreſs ſometimes one ſound and ſometimes another; which practice has brought a great deal of confuſion into the lan-

guage,

guages, and rendered the learning of the modern tongues much more difficult than it would otherwiſe have been. This conſideration, together with the deficiency of all the known alphabets, from their wanting ſome letters to expreſs certain ſounds, has occaſioned ſeveral attempts towards an univerſal alphabet, to contain an enumeration of all ſuch ſingle ſounds or letters, as are uſed in any language. See the article ALPHABET.

Grammarians diſtinguiſh letters into vowels, conſonants, mutes, liquids, diphthongs, and characteriſtics. They are alſo divided into labial, dental, guttural, and palatal, and into capital and ſmall letters. They are alſo denominated from the ſhape and turn of the letters; and in writing are diſtinguiſhed into different hands, as round-text, german-text, round hand, italian, &c. and in printing, into roman, *italic*, and black letter. The term letter, or type, among printers, not only includes the CAPITALS, SMALL CAPITALS, and ſmall letters, but all the points, figures, and other marks, caſt and uſed in printing; and alſo the large ornamental letters, cut in wood or metal, which take place of the illumined letters uſed in manuſcripts. The letters uſed in printing are caſt at the ends of ſmall pieces of metal, about three quarters of an inch in length; and the letter being not indented, but raiſed, eaſily give the impreſſion, when, after being blacked with a glutinous ink, paper is cloſely preſſed upon it. See the article TYPE.

A fount of letters includes ſmall letters, capitals, ſmall capitals, points, figures, ſpaces, &c. but beſides theſe they have different kinds of two-lined letters, only uſed for titles, and the beginning of books, chapters, &c. See the article FOUNT.

LETTER *of attorney*, in law, is a writing by which one perſon authoriſes another to do ſome lawful act in his ſtead, as to give ſeiſin of lands, to receive debts, ſue a third perſon, &c.

The nature of this inſtrument is to tranſfer to the perſon to whom it is given, the whole power of the maker, to enable him to accompliſh the act intended to be performed. It is either general, or ſpecial; and ſometimes it is made revocable, which is when a bare authority is only given; and ſometimes it is irrevocable, as where debts, &c. are aſſigned from one perſon to another. It is generally held, that the power granted to the attorney muſt be ſtrictly purſued; and that where it is made to three perſons, two cannot execute it. In moſt caſes, the power given by a letter of attorney determines upon the death of the perſon who gave it. No letter of attorney made by any ſeaman, &c. in any ſhip of war, or having letters of marque, or by their executors, &c. in order to impower any perſon to receive any ſhare of prizes, or bounty-money, ſhall be valid, unleſs the ſame be made revocable, and for the uſe of ſuch ſeamen, and be ſigned and executed before, and atteſted by, the captain and one other of the ſigning officers of the ſhip, or the mayor or chief magiſtrate of ſome corporation.

LETTERS-CLAUSE, or CLOSE LETTERS, are oppoſed to letters-patent, becauſe they are commonly ſealed up with the king's ſignet or privy-ſeal, while letters-patent are left open.

LETTERS *of credit*, among merchants, is a letter wrote by a merchant or banker, to his correſpondent abroad, requeſting him to credit the bearer as far as a certain ſum. See the article CREDIT.

LETTER *of licence*, an inſtrument or writing granted by a perſon's creditors, allowing him a certain time for the payment of his debts; by which means he is enabled to proſecute his buſineſs, without fearing an arreſt.

LETTER *of mart*, or *marque*, a letter granted to one of the king's ſubjects, under the privy ſeal, impowering him to make repriſals for what was formerly taken from him by the ſubjects of another ſtate, contrary to the law of mart. See the article MARQUE.

Monitory LETTERS. See MONITORY.

LETTERS-PATENT, or OVERT, are writings ſealed with the great ſeal of England, ſo called, becauſe they are open with the ſeal affixed to them. Theſe are granted to authoriſe a man, to do, or enjoy, what of himſelf he could not do. See the article PATENT.

Pacific LETTERS, *literæ pacificæ*, in church-hiſtory, teſtimonial letters given by the biſhop, or chorepiſcopus, to their prieſts, when they had occaſion to travel abroad, certifying that the bearer was a catholic, and in communion with the church.

Paſchal LETTER, a letter written by the pope to all metropolitans, to inform them on what day eaſter was to be celebrated.

LETTERE, a town of Italy, in the kingdom of Naples and hither Principate, ſituated on the gulph of Naples: eaſt

longitude 15°, and north lat. 40° 45′.

LETTUCE, *lactuca*, in botany, a genus of the ſyngeneſia-polygamia-æqualis claſs of plants, the compound flower of which is imbricated and uniform, with numbers of equal hermaphrodite corollulæ ſhorter than the cup; the partial corolla is monopetalous, ligulated, truncated, and quadri or quinquedentated; it has no pericarpium; the cup is connivent and ovato-cylindric; the ſeed is ſingle, ovated, acuminated and compreſſed. The common lettuce is generally ſown for cutting very young, to mix with other ſalad herbs in ſpring; the cabbage lettuce is only this mended by culture: it may be ſown at all times of the year; but in the hot months requires to be ſown in ſhady borders. The cabbage-lettuce may alſo be ſown at different ſeaſons, to have a continuation of it through the ſummer. The firſt crop ſhould be ſown in February, in an open ſituation; the others, at three weeks diſtance, and the latter ones under covert, but not under the dripping of trees. The ſileſia, imperial, royal, black, white and upright cos-lettuces, may be ſown firſt in the latter end of February or the beginning of March, on a warm light ſoil, and in an open ſituation: when the plants are come up, they muſt be thinned to fifteen inches diſtance every way; they will then require no farther care, than the keeping them clear of weeds; and the black cos, as it grows large, ſhould have its leaves tied together, to whiten the inner part. Succeeding crops of theſe ſhould be ſown in April, May, and June, and towards the latter end of Auguſt they may be ſown for a winter crop, to be preſerved under glaſſes, or in a bed arched over with hoops and covered with mats.

The moſt valuable of all the Engliſh lettuces, are the white cos, or the Verſailles, the Sileſia, and the black cos. The brown Dutch and the green capuchin are very hardy, and may be ſown late, under walls, where they will ſtand the winter, and be valuable, when no others are to be had. The red capuchin Roman and prince lettuces, are very early kinds, and are ſown for variety, as are alſo the Aleppo-ones for the beauty of their ſpotted leaves.

The milk of the common garden-lettuces is hypnotic, while the root of the plant is cooling, dilnent and nouriſhing.

LEVANT, a name given to the eaſt part of the Mediterranean ſea, bounded by Natolia or the leſſer Aſia on the north, by Syria and Paleſtine on the eaſt, by Egypt and Barca on the ſouth, and by the iſland of Candia and the other part of the Mediterranean on the weſt.

LEVARI FACIAS, is a writ directed to the ſheriff for levying a certain ſum of money upon the lands, &c. of a perſon who has forfeited his recognizance. There is alſo a levari facias damna de diſſeiſitoribus, which is for the levying of damages wherein the diſſeiſor has been before condemned to the diſſeiſee. There is likewiſe a levari facias reſiduum debiti, to levy the remainder of a debt, upon the lands, tenements, &c. of the debtor, when part has been ſatisfied.

LEVATOR, in anatomy, a name given to ſeveral muſcles: as, 1. To two muſcles of the anus; theſe ariſe on each ſide with a broad baſe, from the internal part of the os pubis, the tunic of the obturator internus, the internal part of the os ileum: and the acute proceſs of the iſchium: from theſe proceed fibres, in the manner of rays, running from a circumference to a center, directing their courſe toward the ſphincter; and finally they unite in the hinder part of the inteſtine, which they ſurround, including at the ſame time the neck of the urinary bladder; the proſtatæ and the ſeminal veſſels in men, and in women the vagina: they are, after this, inſerted partly in the upper and hinder part of the ſphincter, and partly confound and blend their fibres with thoſe of the oval and annular kind, which form the ſphincter; and from this courſe of their fibres it is evident, that they may ſerve not only for ſuſtaining and elevating the anus, but to preſs the veſiculæ ſeminales and proſtatæ in the coitus. 2. Beſide theſe, there are, according to Dr. Douglas, a pair of ſmaller levatores, which ariſe partly tendinous and partly fleſhy, from the protuberance of the iſchium; and are thence carried tranſverſely toward the anus, and are inſerted into its ſphincter, near the bulb of the urethra. 3. The levatores coſtarum of Steno, and ſupra coſtales of Verheyen, which contribute to reſpiration, are of two kinds, diſtinguiſhed, from their figure, into ſhort and long: the ſhort ones are twelve on each ſide; they have their origin from the tranſverſe proceſſes of eleven vertebræ of the back and of the lower one of the neck, and they are inſerted obliquely into the hinder part of the ribs: the long ones are

are three or four; their origin is the ſame from the ſeventh, eighth, ninth, tenth, eleventh, and twelfth ribs.

LEUCADENDRON, in botany, a genus of the tetrandria-monogynia claſs of plants, the general corolla of which is uniform and convex; the partial one is oblong, hoary on the outſide, and compoſed of two petals; the upper petal is a long line or unguis, and its limb is lanceolated, undivided, and in its lower part is firmly joined to the lower petal; the lower petal has alſo a long unguis of a linear figure, but three times as broad as that of the upper petal; the cup, ſcarce at all altered, ſerves inſtead of a pericarpium, and contains a ſingle roundiſh ſeed, coronated with hairs.

LEUCATE, a town of Languedoc, in France, fourteen miles ſouth of Narbonne.

LEUCHTENBERG, a town of Germany, fifteen miles north-eaſt of Amberg.

LEUCOIUM, the GREAT SNOW-DROP, in botany, a genus of the hexandria-monogynia claſs of plants, the corolla of which is of a rounded ſhape, patent, and divided into ſix plane oval petals, almoſt from the very baſe, and their tops ſomewhat thicker and narrower than their middles; their fruit is a turbinated capſule, formed of three valves, and containing three cells; the ſeeds are numerous and roundiſh. This is alſo the name whereby Tournefort calls the cheiranthus of Linnæus. See CHEIRANTHUS.

LEUCOMA, in ſurgery, a diſtemper of the eye, otherwiſe called albugo. See the article ALBUGO.

The cauſes of theſe blemiſhes or ſpots on the eye are various: they may ariſe, 1. from an obſtruction of the pellucid veſſels in the tunica cornea, and an inſpiſſation of their contained juices, proceeding from a violent inflammation of the eye: or, 2. from a ſuppuration, and then an induration of theſe juices in the cornea after an inflammation, ſo that by degrees it becomes more opaque, as it hardens, and puts on a whitiſh hue, being ſomtimes miſtaken for an unguis. 3. Theſe ſpots may ariſe from an external eroſion or ulcer in the cornea. Or, 4. from puſtules or veſiculæ in various inflammatory diſorders, particularly from thoſe which are occaſioned by the ſmall pox. 5. They may proceed from the ſcars after a puncture in the cornea from a ſword, knife, or fork. Or, 6. from a burn, or the corroding acrimony of cauſtic ſubſtances falling into the eye, tho' they may ſometimes be formed of a peculiar tunic growing to the eye itſelf.

Theſe diſorders of the cornea are ſome more and ſome leſs difficult to remove, according to their duration, and the particular cauſes from whence they proceed, with the patient's age and other circumſtances. Infants may be more eaſily freed from them than adults, when they are not of any long ſtanding; but for thoſe which are ſcars formed from wounds, burns, punctures, or the like, there is little or no hope of removing them. Heiſter directs, that theſe ſpots which ariſe from inſpiſſated humours, and are not of long ſtanding, be removed by a proper regimen, attenuating diet and medicines, eſpecially a plentiful uſe of the decoctions and infuſions which are ſudorific; but then, at the ſame time, there muſt be uſed externally phlebotomy, ſcarification, bliſters, and frequent waſhing of the feet, and upon the eye itſelf may be applied diſcutient bags. In thoſe ſpots which proceed from abſceſſes, or a ſuppuration of matter after an inflammation betwixt the laminæ of the cornea, which they elevate like a pea, an inciſion ought to be made into the cornea, to diſcharge the included matter; the inciſion for this purpoſe muſt be made with a lancet, or couching needle, treating the eye afterwards with diſcutient medicines: but when the cornea is eroded, the following method is taken by Mr. St Yves; firſt he removes the inflammation, and then orders the patient to waſh his eye frequently with the aqua viridis ophthalmica Hartmanni, which is made weaker or ſtronger, according as the patient can bear it. In puſtules ariſing from the ſmall pox, there ſhould be an apertion made by a needle or lancet, immediately to diſcharge the eroding matter, removing the pellicle afterwards with ſome burnt alum, candy-ſugar, and the ſhells of eggs, made into powder, and applied every day to the cornea.

LEUCOPHLEGMATIA, in medicine, a kind of dropſy, otherwiſe called anaſarca. See ANASARCA and DROPSY.

LEUE, a town of the auſtrian Netherlands, ſixteen miles eaſt of Louvain.

LEVEL, an inſtrument wherewith to draw a line parallel to the horizon, by means of which the true level, or the difference of aſcent or deſcent between ſeveral places, may be found for conveying water, draining fens, &c.

There are ſeveral inſtruments of different contrivance and matter, invented for the perfection

perfection of levelling, all of which, for the practice, may be reduced to those that follow.

Air-LEVEL, that which shews the line of level by means of a bubble or air inclosed with some liquor in a glass-tube of an indeterminate length and thickness, whose two ends are hermetically sealed. When the bubble fixes itself at a certain mark, made exactly in the middle of the tube, the plane or ruler wherein it is fixed is level. When it is not level, the bubble will rise to one end. This glass-tube may be set in another of brass, having an aperture in the middle, whence the bubble of air may be observed. The liquor wherewith the tube is filled, is oil of tartar, or aqua fecunda; those not being liable to freeze as common water, nor to rarefaction and condensation, as spirit of wine is. There is one of these instruments with sights, being an improvement upon that last described, which, by the addition of more apparatus, becomes more commodious and exact. It consists of an air-level, see plate CLVI. n° 1. about eight inches long, and seven or eight lines in diameter, set in a brass-tube. 2. with an aperture in the middle, C. The tubes are carried in a strong straight ruler, a foot long, at whose ends are fixed two sights, 3, 3, exactly perpendicular to the tubes, and of an equal height, having a square hole, formed by two fillets of brass crossing each other at right angles, in the middle whereof is drilled a very little hole, through which a point on a level with the instrument is descried. The brass-tube is fastened on the ruler by means of two screws, one whereof, marked 4, serves to raise or depress the tube at pleasure, for bringing it towards a level. The top of the ball and socket is rivetted to a little ruler that springs, one end whereof is fastened with screws to the great ruler, and at the other end has a screw, 5, serving to raise and depress the instrument when nearly level.

This instrument, however, is yet less commodious than the following one, because though the holes be ever so small, yet they will still take in too great a space to determine the point of level precisely.

This instrument consists of an air level, with telescope-sights: this level (*ibid.* n° 2.) is like the last, with this difference, that instead of plane sights, it carries a telescope to determine exactly a point of level at a good distance. The telescope is a little brass-tube, about fifteen inches long fastened on the same ruler as the level. At the end of the tube of the telescope, marked 1. enters the little tube, 1, carrying the eye-glass and an hair horizontally placed in the focus of the object-glass, 2. which little tube may be drawn out, or pushed into the great one, for adjusting the telescope to different sights: at the other end of the telescope is placed the object-glass. The screw 3, is for raising or lowering the little fork, for carrying the hair, and making it agree with the bubble of air, when the instrument is level; and the screw 4, is for making the bubble of air, D or E, agree with the telescope: the whole is fitted to a ball and socket. M. Huygens is said to be the first inventor of this level, which has this advantage, that it may be inverted by turning the ruler and telescope half round; and if then the hair cut the same point that it did before, the operation is just.

It may be observed, that one may add a telescope to any kind of level, by applying it upon or parallel to the base or ruler, when there is occasion to take the level of remote objects.

Dr. Desaguliers contrived an instrument, by which the difference of level of two places, which could not be taken in less than four or five days with the best telescope-levels, may be taken in as few hours. The instrument is as follows: to the ball C (*ibid.* n° 3.) is joined a recurve tube B A, with a very fine bore, and a small bubble at top, A, whose upper part is open. It is evident from the make of this instrument, that if it be inclined in carrying, no prejudice will be done to the liquor, which will always be right both in the ball and tube, when the instrument is set upright. If the air at C, be so expanded with heat, as to drive the liquor to the top of the tube, the cavity A, will receive the liquor, which will come down again and settle at D, or near it, according to the level of the place where the instrument is, as soon as the air at C, returns to the same temperament as to heat and cold. To preserve the same degree of heat, when the different observations are made, the machine is fixed in a tin vessel E F, filled with water up to *g h*, above the ball, and a very sensible thermometer has also its ball under water, that one may observe the liquor at D, in each experiment, when the thermometer stands at the same height as before. The water is poured out when the instrument is carried, which

BRITISH MUSEUM

perfection of levelling, all of which, for the practice, may be reduced to those that follow.

Air-LEVEL, that which shews the line of level by means of a bubble or air inclosed with some liquor in a glass-tube of an indeterminate length and thickness, whose two ends are hermetically sealed. When the bubble fixes itself at a certain mark, made exactly in the middle of the tube, the plane or ruler wherein it is fixed is level. When it is not level, the bubble will rise to one end. This glass-tube may be set in another of brass, having an aperture in the middle, whence the bubble of air may be observed. The liquor wherewith the tube is filled, is oil of tartar, or aqua fecunda; those not being liable to freeze as common water, nor to rarefaction and condensation, as spirit of wine is. There is one of these instruments with sights, being an improvement upon that last described, which, by the addition of more apparatus, becomes more commodious and exact. It consists of an air-level, see plate CLVI. n° 1. about eight inches long, and seven or eight lines in diameter, set in a brass-tube. 2. with an aperture in the middle, C. The tubes are carried in a strong straight ruler, a foot long, at whose ends are fixed two sights, 3, 3, exactly perpendicular to the tubes, and of an equal height, having a square hole, formed by two fillets of brass crossing each other at right angles, in the middle whereof is drilled a very little hole, through which a point on a level with the instrument is descried. The brass-tube is fastened on the ruler by means of two screws, one whereof, marked 4, serves to raise or depress the tube at pleasure, for bringing it towards a level. The top of the ball and socket is rivetted to a little ruler that springs, one end whereof is fastened with screws to the great ruler, and at the other end has a screw, 5, serving to raise and depress the instrument when nearly level.

This instrument, however, is yet less commodious than the following one, because though the holes be ever so small, yet they will still take in too great a space to determine the point of level precisely.

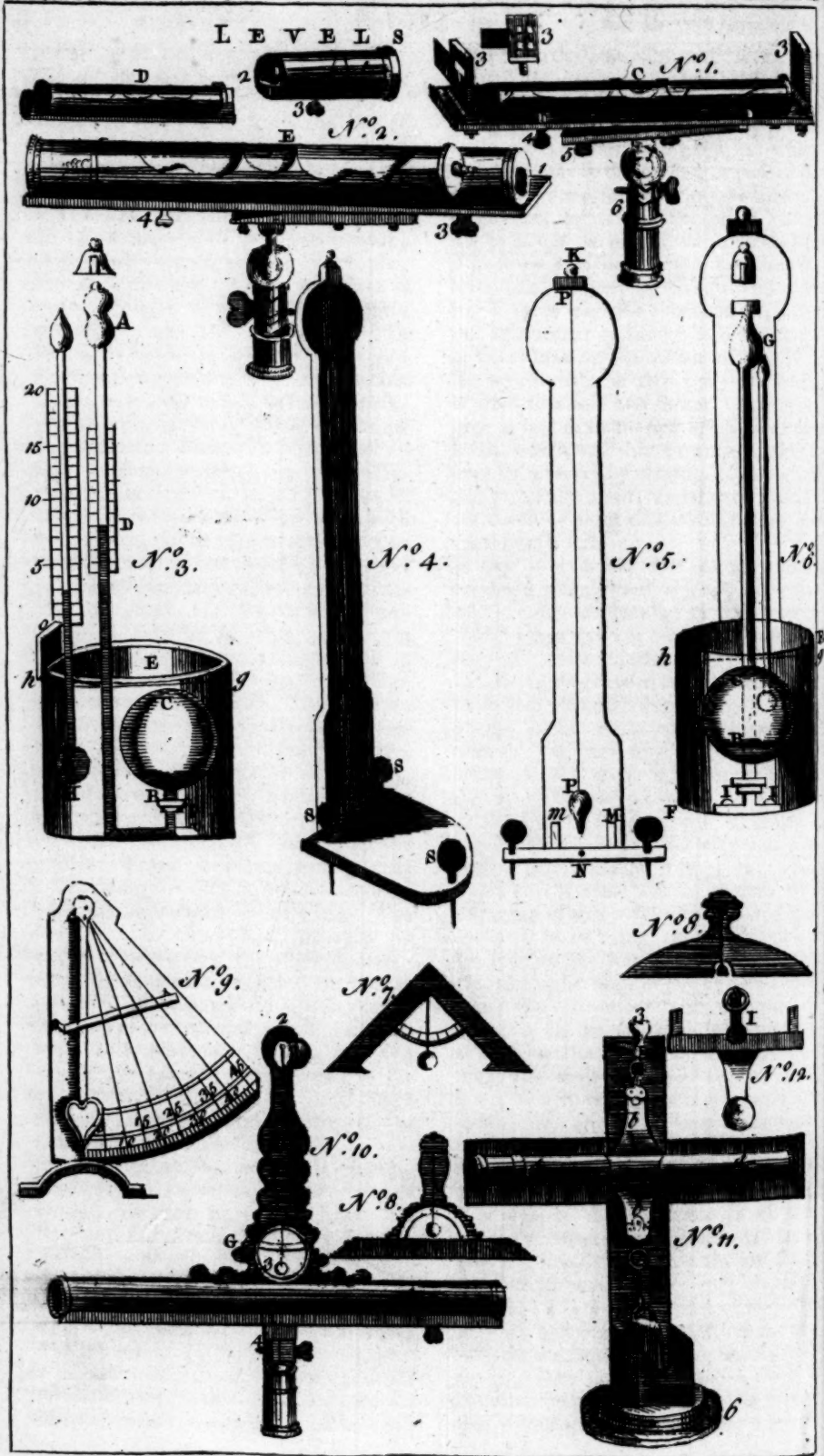
This instrument consists of an air level, with telescope-sights: this level (*ibid.* n° 2.) is like the last, with this difference, that instead of plane sights, it carries a telescope to determine exactly a point of level at a good distance. The telescope is a little brass-tube, about fifteen inches long fastened on the same ruler as the level. At the end of the tube of the telescope, marked 1. enters the little tube, 1, carrying the eye-glass and an hair horizontally placed in the focus of the object-glass, 2. which little tube may be drawn out, or pushed into the great one, for adjusting the telescope to different sights: at the other end of the telescope is placed the object-glass. The screw 3, is for raising or lowering the little fork, for carrying the hair, and making it agree with the bubble of air, when the instrument is level; and the screw 4, is for making the bubble of air, D or E, agree with the telescope: the whole is fitted to a ball and socket. M. Huygens is said to be the first inventor of this level, which has this advantage, that it may be inverted by turning the ruler and telescope half round; and if then the hair cut the same point that it did before, the operation is just.

It may be observed, that one may add a telescope to any kind of level, by applying it upon or parallel to the base or ruler, when there is occasion to take the level of remote objects.

Dr. Desaguliers contrived an instrument, by which the difference of level of two places, which could not be taken in less than four or five days with the best telescope-levels, may be taken in as few hours. The instrument is as follows: to the ball C (*ibid.* n° 3.) is joined a recurve tube B A, with a very fine bore, and a small bubble at top, A, whose upper part is open. It is evident from the make of this instrument, that if it be inclined in carrying, no prejudice will be done to the liquor, which will always be right both in the ball and tube, when the instrument is set upright. If the air at C, be so expanded with heat, as to drive the liquor to the top of the tube, the cavity A, will receive the liquor, which will come down again and settle at D, or near it, according to the level of the place where the instrument is, as soon as the air at C, returns to the same temperament as to heat and cold. To preserve the same degree of heat, when the different observations are made, the machine is fixed in a tin vessel E F, filled with water up to *g h*, above the ball, and a very sensible thermometer has also its ball under water, that one may observe the liquor at D, in each experiment, when the thermometer stands at the same height as before. The water is poured out when the instrument is carried, which

BRITISH MUSEUM

LEVELS



J. Jefferys sculp.

which one may do conveniently by means of the wooden frame, which is ſet upright by the three ſcrews S, S, S, *ibid.* n° 4. and a line and plummet P P, n° 5. At the back part of the wooden frame, from the piece at top K, hangs the plummet P, over a braſs point at N; M *m* are brackets, to make the upright board K N, continue at right angles with the horizontal one at N. N° 6. repreſents a front-view of the machine, ſuppoſing the fore-part of the tin-veſſel tranſparent; and here the braſs-ſocket of the recurve-tube, into which the ball is ſcrewed, has two wings at I I, fixed to the bottom that the ball may not break the tube by its endeavour to emerge, when the water is poured in as high as *g h*.

After the Dr. had contrived this machine, he conſidered that, as the tube is of a very ſmall bore, if the liquor ſhould riſe into the ball at A, n° 3. in carrying the inſtrument from one place to another, ſome of it would adhere to the ſides of the ball A, and upon its deſcent in making the experiment, ſo much might be left behind, that the liquor would not be high enough at D, to ſhew the difference of the level; therefore, to prevent that inconveniency, he contrived a blank ſcrew, to ſhut up the hole at A, as ſoon as one experiment is made, that in carrying the machine, the air in A, may ballance that in C, ſo that the liquor ſhall not run up and down the tube, whatever degree of heat and cold may act upon the inſtrument, in going from one place to another. Now becauſe one experiment may be made in the morning, the water may be ſo cold, that when a ſecond experiment is made at noon, the water cannot be brought to the ſame degree of cold it had in the morning; therefore, in making the firſt experiment, warm water muſt be mixed with the cold, and when the water has ſtood ſome time before it comes to be as cold as it is likely to be at the warmeſt part of that day, obſerve and ſet down the degree of the thermometer at which the ſpirit ſtands, and likewiſe the degree of the water in the barometer at D; then ſcrew on the cap at A, pour out the water, and carry the inſtrument to the place whoſe level you would know; then pour in your water, and when the thermometer is come to the ſame degree as before, open the ſcrew at top, and obſerve the liquor in the barometer.

The doctor's ſcale for the barometer is ten inches long, and divided into tenths; ſo that ſuch an inſtrument will ſerve for any heights not exceeding ten feet, each tenth of an inch anſwering to a foot in height.

The Dr. made no allowance for the decreaſe of denſity in the air, becauſe he did not propoſe this machine for meaſuring mountains (though with a proper allowance for the decreaſing denſity of the air, it will do very well) but for heights that want to be known in gardens, plantations, and the conveyance of water; where an experiment that anſwers two or three feet in a diſtance of twenty miles, will render this a very uſeful inſtrument.

Foot-LEVEL. See the article FOOT-LEVEL.

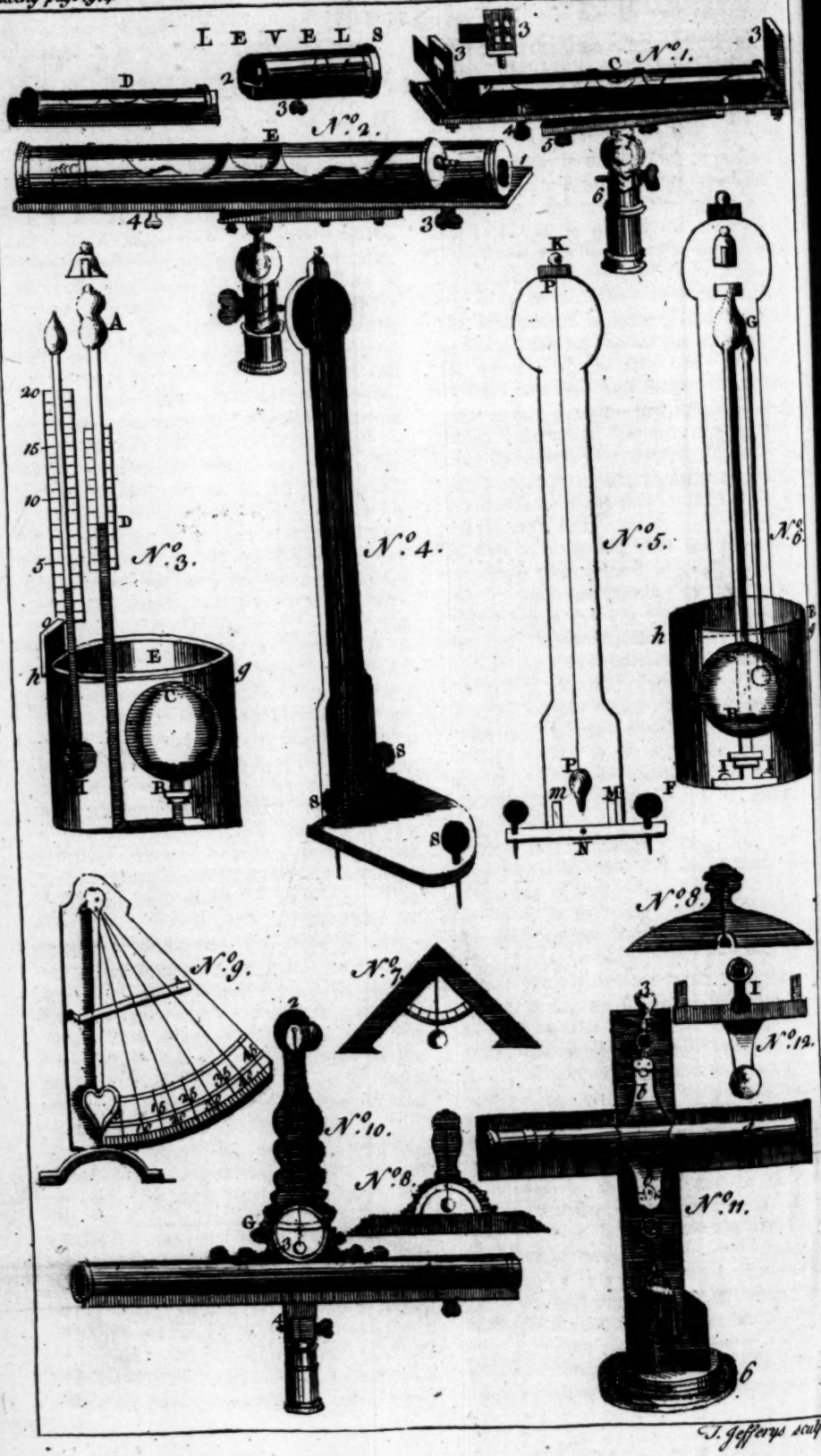
Artillery-Foot-LEVEL is in form of a ſquare, having its two legs or branches of an equal length, at a juncture whereof is a little hole, whence hangs a thread and plummet, playing on a perpendicular line in the middle of a quadrant. It is divided into twice 45 degrees from the middle *ibid.* n° 7.

This inſtrument may be uſed on other occaſions, by placing the ends of its two branches on a plane; for when the thread plays perpendicularly over the middle diviſion of the quadrant, that plane is aſſuredly level. To uſe it in gunnery place the two ends on the piece of artillery, which you may raiſe to any propoſed height, by means of the plummet, whoſe thread will give the degree above the level.

Carpenter's and Paviour's LEVEL, conſiſts of a long ruler in the middle whereof is fitted, at right angles, another ſomewhat bigger, at the top of which is faſtened a line, which, when it hangs over a fiducial line at right angles with the baſe, ſhews that the ſaid baſe is horizontal. Sometimes this level is all of one board. *Ibid.* n° 8.

Gunner's LEVEL, for levelling cannons and mortars, conſiſts of a triangular braſs-plate, about four inches high, *ibid.* 9. at the bottom of which is a portion of a circle, divided into 45 degrees, which number is ſufficient for the higheſt elevation of cannons and mortars, and for giving ſhot the greateſt range: on the center of this ſegment of a circle is ſcrewed a piece of braſs, by means of which it may be fixed or ſcrewed at pleaſure; the end of this piece of braſs is made ſo as to ſerve for a plummet and index, in order to ſhew the different degrees of elevation of pieces of artillery. This inſtrument has

LEVELS


N.o 1.
N.o 2.
N.o 3.
N.o 4.
N.o 5.
N.o 6.
N.o 7.
N.o 8.
N.o 9.
N.o 10.
N.o 11.
N.o 12.
J. Jefferys sculp.

which one may do conveniently by means of the wooden frame, which is ſet upright by the three ſcrews S, S, S, *ibid.* n° 4. and a line and plummet P P, n° 5. At the back part of the wooden frame, from the piece at top K, hangs the plummet P, over a braſs point at N; M *m* are brackets, to make the upright board K N, continue at right angles with the horizontal one at N. N° 6. repreſents a front-view of the machine, ſuppoſing the fore-part of the tin-veſſel tranſparent; and here the braſs-ſocket of the recurve-tube, into which the ball is ſcrewed, has two wings at I I, fixed to the bottom that the ball may not break the tube by its endeavour to emerge, when the water is poured in as high as *g h*.

After the Dr. had contrived this machine, he conſidered that, as the tube is of a very ſmall bore, if the liquor ſhould riſe into the ball at A, n° 3. in carrying the inſtrument from one place to another, ſome of it would adhere to the ſides of the ball A, and upon its deſcent in making the experiment, ſo much might be left behind, that the liquor would not be high enough at D, to ſhew the difference of the level; therefore, to prevent that inconveniency, he contrived a blank ſcrew, to ſhut up the hole at A, as ſoon as one experiment is made, that in carrying the machine, the air in A, may ballance that in C, ſo that the liquor ſhall not run up and down the tube, whatever degree of heat and cold may act upon the inſtrument, in going from one place to another. Now becauſe one experiment may be made in the morning, the water may be ſo cold, that when a ſecond experiment is made at noon, the water cannot be brought to the ſame degree of cold it had in the morning; therefore, in making the firſt experiment, warm water muſt be mixed with the cold, and when the water has ſtood ſome time before it comes to be as cold as it is likely to be at the warmeſt part of that day, obſerve and ſet down the degree of the thermometer at which the ſpirit ſtands, and likewiſe the degree of the water in the barometer at D; then ſcrew on the cap at A, pour out the water, and carry the inſtrument to the place whoſe level you would know; then pour in your water, and when the thermometer is come to the ſame degree as before, open the ſcrew at top, and obſerve the liquor in the barometer.

The doctor's ſcale for the barometer is ten inches long, and divided into tenths; ſo that ſuch an inſtrument will ſerve for any heights not exceeding ten feet, each tenth of an inch anſwering to a foot in height.

The Dr. made no allowance for the decreaſe of denſity in the air, becauſe he did not propoſe this machine for meaſuring mountains (though with a proper allowance for the decreaſing denſity of the air, it will do very well) but for heights that want to be known in gardens, plantations, and the conveyance of water; where an experiment that anſwers two or three feet in a diſtance of twenty miles, will render this a very uſeful inſtrument.

Foot-LEVEL. See the article FOOT-LEVEL.

Artillery-Foot-LEVEL is in form of a ſquare, having its two legs or branches of an equal length, at a juncture whereof is a little hole, whence hangs a thread and plummet, playing on a perpendicular line in the middle of a quadrant. It is divided into twice 45 degrees from the middle *ibid.* n° 7.

This inſtrument may be uſed on other occaſions, by placing the ends of its two branches on a plane; for when the thread plays perpendicularly over the middle diviſion of the quadrant, that plane is aſſuredly level. To uſe it in gunnery place the two ends on the piece of artillery, which you may raiſe to any propoſed height, by means of the plummet, whoſe thread will give the degree above the level.

Carpenter's and Paviour's LEVEL, conſiſts of a long ruler in the middle whereof is fitted, at right angles, another ſomewhat bigger, at the top of which is faſtened a line, which, when it hangs over a fiducial line at right angles with the baſe, ſhews that the ſaid baſe is horizontal. Sometimes this level is all of one board. *Ibid.* n° 8.

Gunner's LEVEL, for levelling cannons and mortars, conſiſts of a triangular braſs-plate, about four inches high, *ibid.* 9. at the bottom of which is a portion of a circle, divided into 45 degrees, which number is ſufficient for the higheſt elevation of cannons and mortars, and for giving ſhot the greateſt range: on the center of this ſegment of a circle is ſcrewed a piece of braſs, by means of which it may be fixed or ſcrewed at pleaſure; the end of this piece of braſs is made ſo as to ſerve for a plummet and index, in order to ſhew the different degrees of elevation of pieces of artillery. This inſtrument has

has alſo a braſs-foot, to ſet upon cannons or mortars, ſo as when thoſe pieces are horizontal, the inſtrument will be perpendicular. The foot of this inſtrument is to be placed on the piece to be elevated, in ſuch a manner, as that the point of the plummet may fall on the proper degree: this is what they call levelling the piece.

Maſon's LEVEL, is compoſed of three rules, ſo joined as to form an iſoceles-rectangle, ſomewhat like a roman A, at the vertex whereof is faſtened a thread, from which hangs a plummet, that paſſes over a fiducial line, marked in the middle of the baſe, when the thing, to which the level is applied, is horizontal; but declines from the mark, when the thing is lower on one ſide than on the other.

Plumb, or *Pendulum* LEVEL, that which ſhews the horizontal lines by means of another line perpendicular to that deſcribed by a plummet or pendulum. This inſtrument, *ibid.* n° 10. conſiſts of two legs or branches, joined together at right angles, whereof that which carries the thread and plummet is about a foot and a half long; the thread is hung towards the top of the branch, at the point a. the middle of the branch where the thread paſſes is hollow, ſo that it may hang free every where: but towards the bottom where there is a little blade of ſilver, whereon is drawn a line perpendicular to the teleſcope, the ſaid cavity is covered by two pieces of braſs, making as it were a kind of caſe, leſt the wind ſhould agitate the thread, for which reaſon the ſilver blade is covered with a glaſs G, to the end that it may be ſeen when the thread and plummet play upon the perpendicular: the teleſcope is faſtened to the other branch of the inſtrument, and is about two feet long; having an hair placed horizontally acroſs the focus of the object-glaſs, which determines the point of the level. The teleſcope muſt be fitted at right angles to the perpendicular. It has a ball and ſocket, by which it is faſtened to the foot, and was invented by M. Picard.

Reflecting LEVEL, that made by means of a pretty long ſurface of water repreſenting the ſame object inverted which we ſee erected by the eye, ſo that the point where theſe two objects appear to meet, is a level with the place where the ſurface of the water is found. This is the invention of M. Mariotte.

There is another reflecting level conſiſting of a mirror of ſteel, or the like, well poliſhed, and placed a little before the object-glaſs of a teleſcope, ſuſpended perpendicularly. This mirror muſt make an angle of 45° with the teleſcope, in which caſe the perpendicular line of the ſaid teleſcope is converted into a horizontal line, which is the ſame with the line of level. This is the invention of M. Caſſini.

Water-LEVEL, that which ſhews the horizontal line by means of a ſurface of water or other liquor, founded on this principle, that water always places itſelf level. See the article FLUID.

The moſt ſimple is made of a long wooden trough, or canal, whoſe ſides are parallel to the baſe, ſo that being equally filled with water, its ſurface ſhews the line of level. This is the chorobates of the antients. See CHOROBATA.

It is alſo made with two cups fitted to the two ends of a pipe, three or four feet long, about an inch in diameter, by means whereof the water communicates from the one to the other cup; and this pipe being moveable on its ſtand by means of a ball and ſocket, when the two cups become equally full of water, their two ſurfaces mark the line of level.

This inſtrument, inſtead of cups, may alſo be made with two ſhort cylinders of glaſs three or four inches long, faſtened to each extreme of the pipe with wax or maſtic. Into the pipe is poured ſome common or coloured water, which ſhews itſelf through the cylinders, by means whereof the line of level is determined; the height of the water, with reſpect to the center of the earth, being always the ſame in both cylinders: this level, tho' very ſimple, is yet very commodious for levelling ſmall diſtances.

LEVEL *of Mr. Huygens's invention*, conſiſts of a teleſcope *a*, *ibid.* n° 11. in form of a cylinder going through a ferril in which it is faſtened by the middle. This ferril has two flat branches *b b*, one above, and the other below, at the ends whereof are faſtened little moving pieces which carry two rings, by one of which the teleſcope is ſuſpended to an hook at the end of the ſcrew 3, and by the other a pretty heavy weight is ſuſpended, in order to keep the teleſcope in equilibrio. This weight hangs in the box 5, which is almoſt filled with linſeed oil, oil of walnuts, or other matter that will not eaſily coagulate, for more aptly ſettling the ballance of the weight and teleſcope. The inſtrument carries two teleſcopes cloſe and very parallel to each other; the eye-glaſs of the one

one being againſt the object-glaſs of the other, that one may ſee each way without turning the level. In the focus of the object-glaſs of each teleſcope muſt a little hair be ſtrained horizontally, to be raiſed and lowered as occaſion requires by a little ſcrew. If the tube of the teleſcope be not found level when ſuſpended, a ferril or ring, 4, is put on it, and is to be ſlid along till it fixes to a level. The hook on which the inſtrument is hung, is fixed to a flat wooden croſs; at the ends of each arm whereof there is a hook ſerving to keep the teleſcope from too much agitation in uſing or carriage. To the ſaid flat croſs is applied another hollow one, that ſerves as a caſe for the inſtrument; but the two ends are left open, that the teleſcope may be ſecured from the weather, and always in a condition to be uſed. The foot of this inſtrument is a round braſs-plate, to which are faſtened three braſs-ferrils, moveable by means of joints wherein are put ſtaves, and on this foot is placed the box.

N° 12. marked I, is a ballance-level; which being ſuſpended by the ring, the two ſights when in equilibrio, will be horizontal, or in a level.

LEVELLING, the art of finding a line parallel to the horizon at one or more ſtations, in order to determine the height of one place with regard to another. See the preceding article.

A truly level ſurface is a ſegment of a ſpherical ſurface, which is concentric to the globe of the earth. A true line of level is an arch of a great circle, which is imagined to be deſcribed upon a truly level ſurface. The apparent level is a ſtraight line drawn tangent to an arch or line of true level. Every point of the apparent level, except the point of contact, is higher than the true level: thus let E A G (plate CLVII. fig. 1. n° 1.) be an arch of a great circle drawn upon the earth; to a perſon who ſtands upon the earth at A, the line H D is the apparent level parallel to his rational horizon R R; but this line, the farther it is extended from his ſtation A, the farther it recedes from the center; for B C is longer than A C, and D C is longer than B C, *&c.* The common methods of levelling are ſufficient for laying pavements of walks, for conveying water to ſmall diſtances, for placing horizontal dials, or aſtronomical inſtruments; but in levelling the bottoms of canals which are to convey water to the diſtance of many miles, the difference between the apparent and true level muſt be taken into the account: thus let I A L (*ibid.* n° 2.) be an arch of a great circle upon the earth: let it be required to cut a canal whoſe bottom ſhall be a true level from A to B, of the length of 5078 feet: the common method is to place the levelling inſtrument in the bottom of the canal at A, and looking through the ſights placed horizontally at a ſtick ſet up perpendicular at B, to make a mark where the viſual ray or point of the apparent level points at E, and then to ſink the bottom of the canal at B as much below E as A is below D. But this will not give the true level: for according to Caſſini's calculation, at the diſtance of 5078 feet the apparent level is ſeven inches above the true; and therefore to make a true level, B muſt be ſunk ſeven inches lower than the apparent level directs; ſo that if A be four feet below D, B muſt be four feet ſeven inches below the mark E. We have here mentioned the error which will ariſe from placing the level at one end of the line to be levelled, and ſhewn how to correct it; but in moſt caſes it is better to take a ſtation in the middle of the line to be levelled: thus if the points H and B are to be levelled, place the inſtrument in the middle at A, and ſetting up ſticks perpendicular at H and B, make marks upon each ſtick where the apparent level points, as E and F; thoſe points are level: and if you ſink H as much below F, as B is below E, H A B will be a true level.

The operation of levelling is as follows: ſuppoſe the height of the point A, (*ibid.* n° 3.) on the top of a mountain above that of the point B, and at the foot thereof, be required. Place the level about the middle diſtance between the two points as in D, and ſtaffs in A and B; and let there be perſons inſtructed with ſignals for raiſing and lowering, on the ſaid ſtaffs, little marks of paſteboard or other matter, the level being placed horizontally by the bubble, *&c.* Look towards the ſtaff A E, and cauſe the mark ſo raiſed to be lowered till the middle, upper edge, or other moſt conſpicuous part, appear in the viſual ray. Then meaſuring exactly the perpendicular height of the point E above the point A, which ſuppoſe ſix feet four inches; ſet that down in your book: then turn the level horizontally about, that the eye-

glaſs of the teleſcope may be ſtill next the eye when you look the other way; if you have only plain ſights, the inſtrument need not be turned; and cauſe the perſon at the ſtaff B, to raiſe or lower his mark till ſome conſpicuous part of it fall in the viſual ray, as at C: then meaſure the perpendicular height of C above B, which ſuppoſe ſixteen feet ſix inches: ſet this alſo down in the book above the other number of the firſt obſervation; ſubtract the one from the other, the remainder will be ten feet two inches, which is the difference of the level between A and B, or the height of the point A above the point B.

If the point D, where the inſtrument is fixed, be in the middle between the two points A and B, there will be no neceſſity for reducing the apparent level to the true level; the viſual ray in that caſe being raiſed equally above the true level. If it be further required to know whether there be a ſufficient deſcent for conveying water from the ſpring A (*ibid.* n° 4.) to the point B. Here in regard the diſtance from A to B is conſiderable, it is required that ſeveral operations be made. Having then choſen a proper place for the firſt ſtation, as at I, ſet up a ſtaff in the point A, near the ſpring, with a proper mark to ſlide up and down the ſtaff, as L, and meaſure the diſtance from A to I, which ſuppoſe two thouſand yards. Then the level being adjuſted in the point I, let the mark L be raiſed and lowered till ſuch time as you ſpy ſome conſpicuous part of it through the teleſcope or ſights of the level, and meaſure the height A L, which ſuppoſe thirteen feet five inches. But in regard the diſtance A I is two thouſand yards, you muſt have recourſe to your table for a reduction, ſubtracting eleven inches, which will leave the height of A L twelve feet ſix inches, and this note down in your book. Now turn the level horizontally about, ſo that the eye-glaſs of the teleſcope may be towards A, and fixing up another ſtaff at H, cauſe the mark G to be moved up and down till you ſpy ſome conſpicuous part through the teleſcope or ſights. Meaſure the height H G, which ſuppoſe ſeven yards one foot two inches. Meaſure likewiſe the diſtance of the points I H, which ſuppoſe one thouſand three hundred yards, for which diſtance four inches eight lines muſt be ſubtracted from the height H G, which conſequently will only leave ſeven yards nine inches four lines, to be taken down in your book. This done, remove the level forwards to ſome other eminence as E, whence the ſtaff H may be viewed; as alſo another ſtaff at D, near the place whither the water is to be conveyed. The level being again adjuſted in the point E, look back to the ſtaff H, and managing the mark as before, the viſual ray will give the point F. Meaſure the height H F, which ſuppoſe eleven feet ſix inches. Meaſure likewiſe the diſtance H E, which ſuppoſe a thouſand yards, for which there is two inches nine lines of abatement, which being taken from the height H F, there will remain eleven feet three inches three lines, which enter in your book. Laſtly, turning the level to look at the next ſtaff D, the viſual ray will give the point D. Meaſure the height of D from the ground, which ſuppoſe eight feet three inches. Meaſure alſo the diſtance from the ſtation E to B, which ſuppoſe nine hundred yards, for which diſtance there are two inches three lines of abatement, which being taken from the height B D, there will remain eight feet nine lines, which enter as before.

For the manner of entering down obſervations in your book, obſerve that when a proper place or ſtation for the level between the two points has been pitched upon, write down the two heights obſerved at that ſtation in two different columns, *viz.* under the firſt column, thoſe obſerved in looking through the teleſcope when the eye was from the ſpring, or towards the point, which we may call back-ſights; and under the ſecond column, thoſe obſerved when the eye was next the ſpring, which we call foreſights. Having ſummed up the heights of each column ſeparately, ſubtract the leſſer from the greater, the remainder will be the difference of the level between the points A and B. If the diſtance of the two points be required, add all the diſtances meaſured together; and dividing the difference of height by the yards of the diſtances, for each two hundred yards you will have a deſcent of about two inches nine lines.

Dr. Halley ſuggeſts a new method of levelling, performed wholly by means of the barometer, in which the mercury is found to be ſuſpended to ſo much the leſs height, as the place is farther removed from the center of the earth; whence the different heights of the mercury in two places,

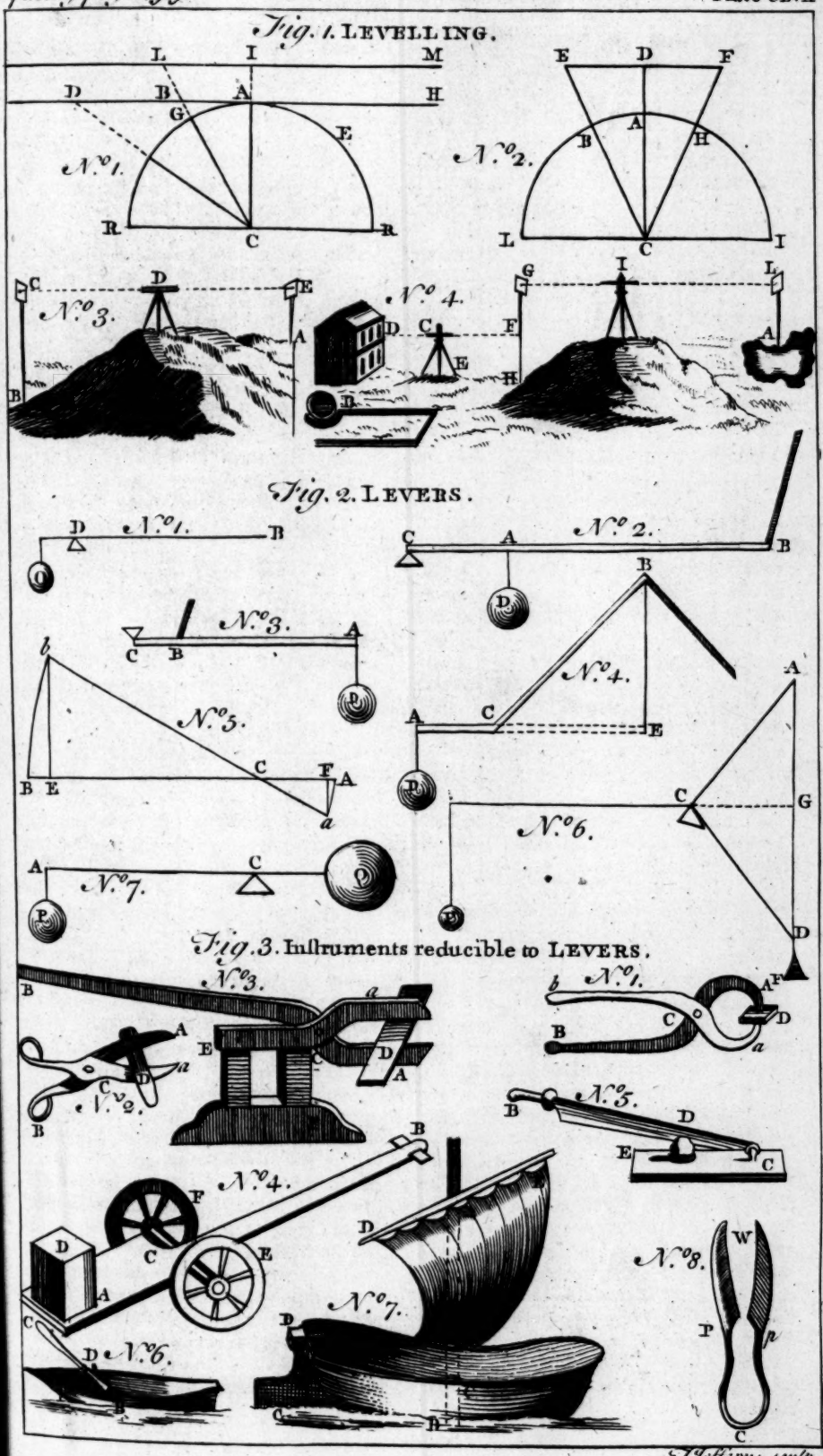


Fig. 1. LEVELLING.
N.o 1.
N.o 2.
N.o 3.
N.o 4.
Fig. 2. LEVERS.
N.o 1.
N.o 2.
N.o 3.
N.o 4.
N.o 5.
N.o 6.
N.o 7.
Fig. 3. Instruments reducible to LEVERS.
N.o 3.
N.o 1.
N.o 2.
N.o 5.
N.o 4.
N.o 7.
N.o 6.
N.o 8.
J. Jeffreys sculp.

BRITISH MUSEUM

places gives the difference of level. This method has been put in practice by ſome of the french academy.

LEVELLING-STAVES, inſtruments uſed in levelling, ſerving to carry the marks to be obſerved, and at the ſame time to meaſure the heights of thoſe marks from the ground. They uſually conſiſt each of two long wooden rulers, made to ſlide over one another, and divide into feet, inches, &c.

LEVER, or LEAVER, in mechanics, an inflexible right line, rod, or beam, ſupported in a ſingle point on a fulcrum or prop, and uſed for the raiſing of weights; being either void of weight itſelf, or at leaſt having ſuch a weight as may be commodiouſly counter-ballanced.

The lever is the ſecond, or, as others will have it, the firſt of thoſe called mechanical powers, or ſimple machines, as being of all others the moſt ſimple; and is chiefly applied, for raiſing weights to ſmall heights.

In a lever there are three things to be conſidered, the weight to be raiſed or ſuſtained, as O, (plate CLVII. fig. 2. n° 1.) The power by which it is to be raiſed or ſuſtained, as B. And the fulcrum or prop D, whereon the lever is ſuſtained, or rather on which it moves round, the fulcrum remaining fixed.

Levers are of three kinds; the firſt is that wherein the prop or fixed point D, (n° 1.) is between the weight ſuſpended at the end O, and the power applied at the other end B: it is plain that ſciſſars, pincers, ſnuffers, &c. are levers of this kind. The lever of the ſecond kind, is that wherein the fulcrum C, (n° 2.) is at one end, and the power applied at the other end B, the weight D being ſuſpended at the point A between the ends; that is, between the power and the fixed point: it is plain that the oars and rudder of a boat are ſuch levers; as alſo cutting knives as are fixed at one end, as thoſe uſed by druggiſts for cutting aromatic wood and roots, by bakers for cutting their bread; and likewiſe doors, whoſe hinges are as the fixed point.

The lever of the third kind, is that whoſe fixed point C, (n° 3.) is at one end, and the weight D ſuſpended at the other end A, the power being applied at the point B between the ends; that is, between the weight and the fulcrum: it is plain that a ladder which is lifted by the middle, in order to rear it againſt a wall, is a lever of this kind.

There is yet a fourth kind of lever, called the bended lever, ſo called from its being bent at the fixed point C, (n° 4.): it appears plainly that ſuch a lever is of the firſt kind, becauſe the weight D hangs at its end A, and the power is applied at its other end B, where it draws by the line of direction B E: a hammer to draw out a nail, is a bended lever.

We ſhall here demonſtrate the law of the equilibrium in the lever, which is the foundation of all the other propoſitions of this kind in mechanics.

Theorem I. Let A B (n° 5.) be a lever only moveable round the fulcrum C, the ſpace deſcribed by each of its points will be as its diſtance from the fulcrum.

For let the lever be moved out of the ſituation A C B, into the ſituation *a* C *b*, the point A will deſcribe the periphery A *a*, but B will paſs over the periphery B *b*. Now by reaſon of the ſimilar ſectors A C *a*, B C *b*, A *a* is to B *b*, as A C to B C; that is, the ſpaces deſcribed by the points A and B, are as their diſtances from the fulcrum. If to the points A and B be applied powers drawing the brachia of the lever perpendicularly, the ſpaces that are deſcribed by them according to or contrary to their propenſions, are not the peripheries A *a*, B *b*, but the perpendiculars *a* F, *b* E, let fall on the brachia of the lever. For the power in A is moved, according to its proper direction or propenſion, through the ſpace *a* F only, and no farther: as, for the ſame cauſe, the way paſſed thro' by the power B, according to its proper direction, is to be eſtimated by *b* E. But by reaſon of the equiangular triangles *a* C F, *b* C E, *a* F is to *b* E as *a* C or A C to *b* C or B C; that is, the ſpaces run over by powers according to their proper directions, will be as their diſtances from the fulcrum.

But if the direction of the power is not a right line, perpendicular to the brachium of the lever A C, (n° 6.) let, from the fulcrum to the line of direction, be drawn the perpendicular C G, and the ſpace deſcribed by the power according to its propenſion, will be proportionable to that perpendicular: for it matters not whether the thread F G A, by which the power acts, is affixed to the point G or A, or indeed to the point D; for the line of direction remaining the ſame, its force to move round the plane A D C B, will be the ſame, as if the thread was fixed to the point G, and the way deſcribed by it in a given time, according to its

proper direction, will be proportionable to the right line C G. Wherefore it is manifeſt in every caſe, that the way deſcribed by any force according to its proper direction, is proportionable to the diſtance of the line of direction from the fulcrum.

Theorem II. In a lever, the moving force or power that has to the weight the ſame ratio, which the diſtance of the line of direction of the weight from the fulcrum, has to the diſtance of the direction of the power from the fulcrum, will ſuſtain the weight; and therefore if it be ever ſo little increaſed, it will raiſe the weight.

It is manifeſt from the preceding theorem, that the ſpaces which are deſcribed by a power and weight according or contrary to their proper propenſions, are proportionable to the diſtances of the lines of direction from the fulcrum; but the velocities are proportionable to theſe ſpaces, and conſequently will be alſo proportionable to the diſtances. If therefore the power P is to the weight Q, (n° 7.) as C Q, the diſtance of the direction of the weight from the fulcrum to C A, the diſtance of the direction of the power from the fulcrum, the power will be to the weight, as the velocity of the weight to the velocity of the power; the momentum therefore of the power, will be equal to the momentum of the weight: and conſequently the power will be equivalent to the weight; which if it be ever ſo little increaſed, it will raiſe the weight. Q. E D.

Hence appears the reaſon, why by the ſtatera romana, or ſteelyard, as it is commonly called, the weights of different bodies are examined all by one and the ſame weight only. For this inſtrument is a lever of unequal brachia, one whereof, C Q, is extended in length from the axis of motion C, and which ought to be the axis of equilibrium, ſuppoſe one inch, or leſs; the other brachium, A C, may be of any greater length that is capable of being exactly divided into parts, each equal to C Q, and numbered by figures, 1, 2, 3, 4, &c. Then if the body whoſe weight we want to diſcover is hung on at Q, the given or known weight P is moveable on the contrary brachium; and by removing it from or bringing it nearer the center C, is diſcovered the diſtance where is an exact equilibrium. See the article BALLANCE.

Thus, there is a great affinity betwixt the lever and common ballance, only the center is not in the middle, but near one end; for which reaſon it is uſed to elevate or raiſe a great weight.

If we examine the inſtruments in common uſe, we ſhall find many of them reducible to levers of one kind or other, as hinted above. Thus a pair of pincers is made up of two levers of the firſt kind, whoſe common center of motion is at the rivet C, (*ibid.* fig. 3. n° 1.) the power being applied at the handles B *b* to preſs them together, and thereby pinch the body D between the oppoſite extremities A *a*; in which caſe the power acts with ſo much the greater force, as the handles C B, C *b*, are longer than the diſtance C A, *c a*. So a pair of common ſciſſars, (*ibid.* n° 2.) acts upon the ſame principles. The force of a lever in this way, is remarkable in the braſier's and tinman's ſheers, whereby one man preſſing upon the handle B, (*ibid.* n° 3.) and raiſing the lower ſide A C, moveable about the center C, is able to cut a plate of braſs or copper D, a quarter of an inch thick; the other ſhorter lever *a* C B being riveted to a couple of ſtrong ſtandards fixed in the block F. The little cart, B C A, (*ibid.* n° 4.) likewiſe belongs to the levers of the firſt kind; whereby a ſingle man at B, is able to lift a heavy ſtone D, upon the axle-tree of the wheels E F as a fulcrum; and being raiſed, by means of the ſame wheels, can convey it to the place required.

The cutting-knife, C D B, (*ibid.* n° 5.) uſed by many artificers, is a lever of the ſecond kind; as being moveable on the joint or center of motion C, whereby it is faſtened to the plank C E; and the power applied at B to cut the weight D, placed between it and the center of motion. A pair of bellows are two levers of the ſecond kind, whoſe common center of motion is at the end of the board where the noſe begins; the power being applied at the handles, whilſt the air to be preſſed out is the weight. The oars of a boat or galley, as well as the rudder, are likewiſe levers of the ſecond kind; for the water at C, (*ibid.* n° 6. and 7.) makes a reſiſtance as a fulcrum, whilſt the man or power acts at B to puſh forward the veſſel by that part of the oar or rudder D, which reſt upon it. The maſts of ſhips are alſo to be reckoned among the levers of the ſecond kind; the fulcrum being at the bottom of the ſhip B, (*ibid.* n° 7.) and the moving force the wind gathered in the ſail, which by

the help of the ſail-yard DAE is applied at A, the upper end of the maſt; whilſt the weight or body to be moved, *viz.* the veſſel C, is placed between the power and fulcrum: hence appears the reaſon why a ſhip ſails ſwifteſt when the yard is raiſed high, becauſe of its greater diſtance from the fulcrum.

The ſheep-ſheers, WPC, (*ibid.* n° 8.) are two levers of the third kind; the common center of motion being at the ſpringing bow at C, whilſt the power or hand is applied at P *p*, and the wool to be cut is the weight at W. A pair of tongs are likewiſe levers of the third kind. But the uſe of levers of the third kind is moſt beautifully ſhewn in the animal body, where the all-wiſe Creator has given animals a power of moving their limbs with great velocity, by applying the power of the muſcles very near the center of motion; for the theory of which, ſee the articles MUSCLE and OSTEOLOGY.

LEVERET, among ſportſmen, denotes a hare in the firſt year of her age.

LEVIGATION, in pharmacy and chemiſtry, the reducing hard and ponderous bodies to an impalpable powder, by grinding them on a porphyry, or the like. See the article PORPHYRY.

It is generally neceſſary in levigation, to add ſome fluid to the matter, which purpoſe is anſwered equally well by common water, as by roſe or other ſimple diſtilled water; ſince, in drying the powders, theſe laſt totally exhale without having imparted any virtue to the preparation.

LEVITE, in a general ſenſe, means all the deſcendants of Levi, among whom were the jewiſh prieſts themſelves, who being deſcended from Aaron, were likewiſe of the race of Levi: but it is more particularly uſed for an order of officers in that church, who were employed in performing the manual ſervice of the temple, ſuch as in fetching wood, water, and other things neceſſary for the ſacrifices; and in ſinging and playing upon inſtruments of muſic.

The conſecration of the levites was to be performed with the following ceremonies: they were to be ſprinkled with the water of expiation, to ſhave all their fleſh, and waſh their cloaths: they were then to bring two bullocks before the door of the tabernacle, where the whole congregation laid their hands upon the levites heads: the bullocks were then ſacrificed, one for a burnt offering, and the other for a ſin offering; and, laſtly, they were to be preſented to the high-prieſt, who was to conſecrate them to the Lord.

The levites were ſubſiſted by the tythe of all the corn, fruit and cattle, throughout Iſrael; a tythe of which tythe they were to give to the prieſts: they had alſo forty-eight cities for their habitation; and while they were actually employed in the ſervice of the temple, they were ſubſiſted out of the daily ſacrifices.

LEVITICUS, a canonical book of the Old Teſtament, ſo called from its containing the laws and regulations relating to the prieſts, levites, and ſacrifices.

The ſeven firſt chapters of this book preſcribe the ceremonies to be obſerved in offering burnt-ſacrifices, meat-offerings, peace-offerings, &c. then Moſes relates in what manner the prieſts were to be conſecrated, and the misfortune of Nadab and Abihu, who offered incenſe to the Lord with ſtrange fire. Upon this occaſion, he preſcribes ſome laws concerning the mourning of the prieſts, and forbids their drinking wine, while they were employed in the ſervice of the tabernacle. In the eleventh, twelfth, thirteenth, and fourteenth chapters, he lays down rules for diſtinguiſhing clean and unclean beaſts, and concerning the leproſy, purifications, &c. appoints the ceremonies to be obſerved upon the great day of expiation: regulates the degrees of kindred within which perſons were allowed or forbidden to marry: prohibits alliances with the Canaanites, and alſo idolatry, theft, perjury, calumny, &c. In the twenty third chapter, he takes notice of the principal annual feſtivals, the paſſover, pentecoſt, &c. preſcribes what was to be obſerved in the ſabbatical and jubilee-years, and concludes with regulations concerning vows and tythes.

LEVITY, in phyſiology, the privation or want of weight in any body, when compared with another that is heavier than it, in which ſenſe it ſtands oppoſed to gravity. See the articles GRAVITATION and GRAVITY.

The ſchools maintain, that there is ſuch a thing as poſitive and abſolute levity, and impute to this the riſe or emergency of bodies lighter in ſpecie than the bodies wherein they riſe; but from the laws of gravitation, which we have delivered under that article, we learn that there is no ſuch thing as abſolute levity in nature: beſides, Mr. Boyle has overthrown this doc-

doctrine of positive and absolute levity by repeated experiments, as may be seen at large in the second volume of Shaw's Boyle, page 362—365.

LEVERPOOL. See LIVERPOOL.

LEUROUX, a town of France, in the province of Orleanois, thirty-five miles south-west of Bourges.

LEUTKIRK, a town of Germany, in the circle of Swabia, thirty-five miles south of Ulm.

LEUTMERTIS, a city of Bohemia, 25 miles north of Prague.

LEVY, in law, signifies to gather or collect, as to levy money; and to levy a fine of lands, is the passing a fine.

LEWARDEN, a city of the United Provinces, the capital of west Friesland: east long. 5° 35′, north lat. 53° 20′.

LEWES, a borough-town of Sussex, forty miles south of London, which sends two members to parliament.

LEWIS, the most northerly of any of the western islands of Scotland, lying in 8° odd minutes west long. and between 58° and 59° odd minutes north lat.

LEWIS. See the article FORT-LEWIS.

LEWIS-PORT. See PORT LOUIS.

LEWISBOURG, the capital of Cape Breton, in North America: west long. 61° 30′, north lat. 46° 50′.

LEXICON, the same as dictionary, but chiefly used in speaking of greek dictionaries, See DICTIONARY.

LEYDEN, a city of Holland, in which there is a famous university, situated twenty miles south of Amsterdam.

LEYNA, a river of Germany, which rises in the confines of Hesse, and discharges itself into the river Aller, at Batmar.

LEYS, in country affairs, denote pasture-grounds, or arable lands turned into pasture. See the article PASTURE.

LEYTE, one of the Philippine islands, separated from the island Philippina by a narrow channel: east long. 223°, north lat. 11°.

LEZINA, a town of the kingdom of Naples, situated on a bay of the gulph of Venice, seventy-five miles north-east of Naples.

LHON, a river which rises in the landgravate of Hesse-Cassel, and falls into the Rhine almost opposite to Coblentz.

LIBANUS, a range of mountains in asiatic Turky, between Syria and Palestine, which extend from Sidon on the Levant, eastward beyond Damascus.

LIBATION, a religious ceremony among the antient pagans, which consisted in an effusion of liquors poured on the head of the victims prepared for sacrifice.

Libations were also in use among the Hebrews, who poured a hin of wine on the victim after it was killed, and the several pieces of the sacrifice were laid on the altar, ready to be consumed in the flames.

The mingrelian christians use a sort of libation at their meals. Before they sit down to table, they take up the first glass of wine that is poured out, and after calling upon the name of the Lord, and paying their respects to the company, sprinkle part of it upon the floor. We meet with the same custom among the antient Romans.

LIBAW, a port-town of Poland, in the dutchy of Courland, situated on a bay of the Baltic: east longitude 21°, north latitude 56° 40′.

LIBEL, injurious reproaches or accusations against a person, written and published in order to expose him to public contempt, hatred or ridicule. The lawyers say, a libel may also be without writing, as where a person is painted with asses ears, a fool's coat, &c. or where a gallows, or any other ignominious sign, is fixed at his door.

Libels are criminal, because where they are made against a private man, they may be the means of exciting him or his friends to seek revenge, and consequently to break the peace: on this account it is no justification of a libel that its contents are true, or that the person libelled has a bad character; for a libel is the more provoking, in proportion as it has the greater appearance of truth: it is therefore held, that in a prosecution on an indictment or information, it is not material whether the matter of a libel be true or false; but in an action upon the case, a defendant may justify that the matter is true. The sending a scandalous letter to the party himself, without shewing or publishing it to others, is no libel; though if it be sent to a third person, or otherwise dispersed, it is a publication of the libel. In the making of libels, if one dictates, another writes, and a third approves of what is written, they are all deemed makers or composers of the libel. The composer, procurer, and publisher of a libel are liable to a fine, imprisonment, the pillory, or the like corporal punishment, at the discretion of the court where the trial is held, and according to the heinousness of the offence.

IBEL, in the law of Scotland, ſignifies an indictment. See INDICTMENT.

IBELLA, or LIBELLULA, in the hiſtory of inſects, a genus of four-winged flies, called in engliſh dragon-flies, or adder-flies; the characters of which are, that they are furniſhed with jaws, the antennæ are ſhort, and the tail terminated by a kind of forceps.

IBER, among botaniſts, denotes the rind or inner bark of trees. See the article BARK.

IBERALIA, in roman antiquity, the ſame with the dionyſia of the Greeks. See the article DIONYSIA.

IBERATE, in law, a writ that lies for the payment of a penſion, or annual ſum, granted under the great ſeal; being directed to the treaſurer and chamberlains of the exchequer.

It is alſo the name of two other writs, one directed to the ſheriff of a county, commanding him to deliver poſſeſſion of lands or goods extended upon the forfeiture of a recognizance; the other directed to a gaoler for delivery of a priſoner, that has put in bail for his appearance.

IBERIA, in roman antiquity, a feſtival obſerved on the ſixteenth of the calends of April, at which time the youth laid aſide their juvenile habit for the toga virilis, or habit peculiar to grown men. See the article TOGA.

IBERTATE PROBANDA, an antient writ for perſons claimed as villains, to prove themſelves free. See VILLAIN.

IBERTATIBUS ALLOCANDIS, a writ which lies for a citizen or burgeſs, to have his privilege allowed.

IBERTUS, in roman antiquity, a perſon who from being a ſlave had obtained his freedom. See MANUMISSION.

The difference between the liberti and libertini was this: the liberti were ſuch as had been actually made free themſelves, and the libertini were the children of ſuch perſons.

IBERTY, *libertas*, in general, denotes a ſtate of freedom, in contradiſtinction to ſlavery. See the article FREEDOM.

According to Cicero, liberty is the power of living as a man pleaſes, or without being controlled by another.

In a legal ſenſe, liberty ſignifies ſome privilege that is held by charter or preſcription.

IBERTY *of the tongue*, in the manege, a void ſpace left in the middle of a bit to give place to a horſe's tongue. See the article BIT.

LIBOURN, a town of France, ten miles north-eaſt of Bourdeaux.

LIBRA, the BALANCE, in aſtronomy, one of the twelve ſigns of the zodiac, the ſixth in order; ſo called becauſe when the ſun enters it, the days and nights are equal, as if weighed in a balance.

Authors enumerate from ten to forty-nine ſtars in this ſign.

LIBRA, in roman antiquity, a pound weight; alſo a coin, equal in value to twenty denarii.

LIBRARY, an edifice or apartment deſtined for holding a conſiderable number of books placed regularly on ſhelves; or, the books themſelves lodged in it.

The firſt who erected a library at Athens was the tyrant Piſiſtratus, which was tranſported by Xerxes into Perſia, and afterwards brought back by Seleucus Nicanor to Athens. Plutarch ſays, that under Eumenes there was a library at Pergamus that contained 200,000 books. That of Ptolemy Philadelphus, according to A. Gellius, contained 700,000, which were all burnt by Cæſar's ſoldiers. Conſtantine and his ſucceſſors erected a magnificent one at Conſtantinople, which in the eighth century contained 300,000 volumes, and among the reſt, one in which the Iliad and Odyſſee were written in letters of gold, on the guts of a ſerpent; but this library was burnt by order of Leo Iſaurus. The moſt celebrated libraries of antient Rome, were the Ulpian and the Palatine, and in modern Rome, that of the Vatican; the foundation of the Vatican library was laid by pope Nicholas, in the year 1450; it was afterwards deſtroyed in the ſacking of Rome, by the conſtable of Bourbon, and reſtored by pope Sixtus V. and has been conſiderably enriched with the ruins of that of Heidelberg, plundered by count Tilly in 1682. One of the moſt complete libraries in Europe, is that erected by Coſmo de Medicis; though it is now exceeded by that of the french king, which was begun by Francis I. augmented by cardinal Richelieu, and completed by M. Colbert. The emperor's library at Vienna, according to Lambecius, conſiſts of 80,000 volumes, and 15,940 curious medals. The Bodleian library at Oxford, exceeds that of any univerſity in Europe, and even thoſe of any of the ſovereigns of Europe, except the emperor's and the french king's, which are each of them older by a hundred years. It was firſt opened in 1602, and

and has ſince been increaſed by a great number of benefactors: indeed the Medicean library, that of Beſſarion at Venice, and thoſe juſt mentioned, exceed it in greek manuſcripts, but it outdoes them all in oriental manuſcripts; and as to printed books, the Ambroſian at Milan, and that of Wolfembuttle, are two of the moſt famous, and yet both are inferior to the Bodleian. The Cotton-library conſiſts wholly of manuſcripts, particularly of ſuch as relate to the hiſtory and antiquities of England; which, as they are now bound, make about 1000 volumes.

In Edinburgh there is a good library belonging to the univerſity, well furniſhed with books; which are kept in good order, and cloiſtered up with wire-doors, that none but the keeper can open; a method much more commodious than the multitude of chains uſed in other libraries. There is alſo a noble library of books and manuſcripts, belonging to the gentlemen of the law.

LIBRATION, in aſtronomy, an apparent irregularity of the moon's motion, whereby ſhe ſeems to librate about her axis, ſometimes from the eaſt to the weſt, and now and then from the weſt to the eaſt; ſo that the parts in the weſtern limb or margin of the moon ſometimes recede from the center of the diſk, and ſometimes move towards it, by which means they become alternately viſible and inviſible to the inhabitants of the earth. See the article MOON.

LIBRATION *of the earth*, is ſometimes uſed to denote the parallelism of the earth's axis, in every part of its orbit round the ſun. See EARTH and PARALLELISM.

LIBYA, in antient geography, a large extent of Africa, lying ſouth-weſt of Egypt.

LICENCE, in law, an authority given to a perſon to do ſome lawful act.

A licence is a perſonal power, and therefore cannot be transferred to another. If the perſon licenſed abuſe the power given him, in that caſe he becomes a treſpaſſer.

LICENCE TO ARISE, in law, is a ſpace of time given by the court to a tenant who is eſſoined de malo lecti, in a real action, to get out of his bed.

LICENTIATE, one who has obtained the degree of a licence.

The greateſt number of the officers of juſtice in Spain, are diſtinguiſhed by no other title but that of licentiate. In order to paſs licentiate in common law, civil law, and phyſic, they muſt have ſtudied ſeven years; and in divinity, ten. Among us, a licentiate uſually means a phyſician who has a licence to practiſe, granted by the college of phyſicians, or the biſhop of the dioceſe. See the article COLLEGE *of phyſicians*.

LICHEN, LIVER-WORT, in botany, a genus of the cryptogamia claſs of plants, which have the moſt perfect fructification of all the moſſes: the flowers are monopetalous, ſtanding on a pedicle, and divided into ſegments at the limb, ſomewhat like ſtars, buttons, muſhrooms, &c. See plate CLVIII. fig. 1.

The grey ground liver-wort, found plentifully with us in woods and heaths, is famous for its virtues againſt the bite of a mad dog: it is the baſis of the pulvis antilyſſus of the ſhops.

LICTORS, *lictores*, in roman antiquity, the ſerjeants or beadles who carried the faſces before the ſupreme magiſtrates: it was alſo a part of their office to be the public executioners in beheading, ſcourging, &c.

As to their number, a dictator had twenty-four, a conſul twelve, the maſter of the horſe ſix, a prætor ſix, and each veſtal virgin had one, whenever they appeared abroad.

LIDD, a market-town of Kent, ſituated near the engliſh channel, five miles ſouth weſt of Romney.

LIDDESDALE, a county of Scotland, bounded by Tiviotdale, on the north; Cumberland, on the ſouth-eaſt; and Annandale, on the ſouth-weſt.

LIEGE, in law, a term ſometimes uſed for liege-lord, or one who owns no ſuperior; and ſometimes for liege-man, or one who owes allegiance to the liege-lord. In our ſtatutes, the king's ſubjects are ſometimes called lieges, or liege-people.

LIEGE, in geography, the capital of the biſhopric of the ſame name in Germany, ſituated on the river Maes, twelve miles ſouth of Maeſtricht: eaſt long. 5° 36′, north lat. 50° 40′.

LIEGEANCE, in law. See the article ALLEGIANCE.

LIEN, the ſpleen, in anatomy. See the article SPLEEN.

LIENTERY, is a flux of the belly, in which, whatever is taken in is diſcharged by ſtool as it is ſwallowed, or very little altered either in colour or ſubſtance. A pain of the ſtomach, ſays Etmuller, is an inſeparable attendant of a lientery, and

and it always torments the patient moſt after eating till he hath gone to ſtool. The urine is in a ſmall quantity, and high coloured. A ſcorbutic lientery is a very dangerous diſtemper, hard to be cured, and very ſubject to relapſes: it diſpoſes the patient to a cachexy, or ill habit, and a tabes.

In the cure of this diſtemper, the ſtomach is, above all things, to be ſtrengthened; rhubarb ought to be taken; preparations of coral and quinces are very much commended; and, in general, all thoſe things uſed againſt vomiting are convenient here. The moſt ſimple ſtomachics, and moſt eaſily prepared, often do more good than the compounds: for example, preſerved nutmegs, or ginger, the white of eggs boiled in vinegar, or wormwood-wine prepared with maſtic.

LIERE, a town of the Auſtrian Netherlands, in the province of Brabant, twelve miles ſouth-eaſt of Antwerp.

LIERS, a village of the biſhopric of Liege, in the circle of Weſtphalia, in Germany, ſituated four miles north of Liege.

LIEUTENANT, an officer who ſupplies the place, and diſcharges the office of a ſuperior in his abſence. Of theſe, ſome are civil, as the lords-lieutenants of kingdoms, and the lords-lieutenants of counties; and others are military, as the lieutenant-general, lieutenant-general of the artillery, lieutenant-colonel, lieutenant of the artillery of the tower, lieutenants of horſe, foot, ſhips of war, *&c.*

Lord LIEUTENANT *of Ireland*, is properly a viceroy, and has all the ſtate and grandeur of a king of England, except being ſerved upon the knee. He has the power of making war and peace, of beſtowing all the offices under the government, of dubbing knights, and of pardoning all crimes except high treaſon; he alſo calls and prorogues the parliament, but no bill can paſs without the royal aſſent. He is aſſiſted in his government by a privy-council; and, on his leaving the kingdom, he appoints the lords of the regency, who govern in his abſence.

Lords LIEUTENANTS *of counties*, are officers, who, upon any invaſion or rebellion, have power to raiſe the militia, and to gve commiſſions to colonels and other officers, to arm and form them into regiments, troops and companies. Under the lords-lieutenants, are deputy-lieutenants, who have the ſame power; theſe are choſen by the lords-lieutenants, out of the principal gentlemen of each county, and preſented to the king for his approbation.

LIEUTENANT-GENERAL, is an officer next in rank to the general; in battle, he commands one of the wings; in a march, a detachment, or a flying camp; alſo a quarter, at a ſiege, or one of the attacks, when it is his day of duty.

LIFE, *vita*, is peculiarly uſed to denote the animated ſtate of living creatures, or the time that the union of their ſoul and body laſts. See the articles ANIMAL, CIRCULATION, FUNCTION, *&c.*

Lord Bacon makes the prolongation of life one of the three branches into which he divides medicine. See the articles MEDICINE and LONGÆVITY.

Doctor Halley, Mr. De Moivre, and others, have taken laudable pains in eſtimating the probabilities of life from the bills of mortality; whence the value of annuities for life have been determined. See the articles MORTALITY and ANNUITY.

Mr. De Moivre obſerving that the probabilities of life decreaſed nearly in arithmetic progreſſion, when conſidered from a term given, found the following eaſy rule for the value of any annuity on a life of a given age, *viz.* $\frac{1-\frac{r}{n}P}{r-1}$; where P repreſents the value of an annuity certain of 1 l. for as many years as are intercepted between the age given, and the extremity of old age, ſuppoſed at 86, and that interval of life is expreſſed by n; and r ſtands for the amount of the principal and intereſt of 1 l. in one year.

The rule therefore, in words at length, will be: Take the value of an annuity certain for ſo many years as are denoted by the complement of life; multiply this value by the rate of intereſt, and divide the product by the complement of life; then let the quotient be ſubtracted from 1, and let the remainder be divided by the intereſt of 1 l. then this laſt quotient will expreſs the value of an annuity for an age given.

Thus, ſuppoſe it were required to find the preſent value of an annuity of 1 l. for an age at 50, intereſt being at 5 *per cent.* The complement of life being 36; let the value of an annuity certain, according to the given rate of intereſt, be taken from the tables of ſuch annuities, and this value will be found to be 16.5468. Let this value be multiplied by the rate

of intereſt 1.05; the product will be 17.3741. Let this product be divided by the complement of life, that is, in this caſe, by 36, the quotient will be 0.04826; ſubtract this quotient from unity, the remainder will be 0.5174. Laſtly, divide this quotient by the intereſt of 1l. that is, in the preſent caſe, 0.05, and the new quotient will be 10.35, which will expreſs the value of an annuity of 1l. to continue during a life of 50, or, in other words, how many years purchaſe a life of 50 is worth.

On theſe principles, he has conſtructed tables of the value of annuities for lives, at different rates of intereſt; one of which we ſhall here inſert, which ſhews the value of an annuity for life, of 1l. when intereſt is at 3, 3½, 4, or 5 *per cent.* And here it is proper to obſerve, that the column, marked *Age*, ſhews the different ages for which the value of an annuity is wanted; and the correſponding columns, marked 3 *per cent.* 3½ *per cent. &c.* expreſs the value of the ſaid ages in years purchaſe, and decimals of a year. Thus, an annuity for life, for the age of 40, is worth 14.84 years purchaſe, when intereſt is at 3 *per cent.* and only 13 98 years purchaſe, when intereſt is at 3½ *per cent.* And ſo in other caſes.

Value of an annuity for life, of 1l. intereſt being

Age.	3 *per cent.*	3½ *per cent.*	4 *per cent.*	5 *per cent.*
9 and 10	19.87	18.27	16.88	14.60
8, 11	19.74	18.16	16.79	14.53
7, 12	19.60	18.05	16.64	14.47
13	19.47	17.94	16.60	14.41
6, 14	19.33	17.82	16.50	14.34
15	19.19	17.71	16.4	14.27
16	19.05	17.59	16.31	14.20
5, 17	18 90	17.46	16.21	14.12
18	18.76	17.33	16.10	14 05
19	18.61	17.21	15.99	13.97
4, 20	18.46	17.09	15.89	13.89
21	18.30	16.96	15.78	13.81
22	18.15	16.83	15.67	13.72
23	17.99	16.69	15.55	13.64
3, 24	17.83	16.56	15.43	13.55
25	17.66	16.42	15.31	13.46
26	17.50	16.28	15.19	13.37
27	17.33	16.13	15.04	13.28
28	17.16	15.98	14.94	13.18
29	16.98	15.83	14.81	13.09
30	16.80	15.68	14.68	12.99
2, 31	16.62	15.53	14.54	12.88
32	16.44	15.37	14.41	12.78
33	16.25	15.21	14.27	12.67
34	16.06	15.05	14.12	12.56
35	15.86	14.89	13.98	12.45
36	15.67	14.71	13.82	12.33
37	15.46	14.52	13.67	12.21
38	15.29	14.34	13.52	12.09
1, 39	15.05	14.16	13.36	11.96
40	14.84	13.98	13.20	11.83
41	14.63	13.79	13.02	11.70
42	14.41	13.59	12.85	11.57
43	14.19	13.40	12.68	11.43
44	13.96	13.20	12.50	11.29
45	13.73	12.99	12.32	11.14
46	13.49	12.78	12.13	10.99
47	13.25	12.57	11.94	10.84
48	13.01	12.36	11.74	10.68
49	12.76	12.14	11.54	10.51
50	12.51	11.92	11.34	10.33
51	12.26	11.69	11.13	10.17
52	12.00	11.45	10.92	9.99
53	11.73	11.20	10.70	9.82
54	11.46	10.95	10.47	9.63
55	11.18	10.69	10.24	9.44
56	10.90	10.44	10.01	9.24
57	10.61	10.18	9.77	9.04
58	10.32	9.91	9.52	8.83
59	10.03	9.64	9.27	8.61
60	9.73	9.36	9.01	8.39
61	9.42	9 08	8.75	8.16
62	9.11	8.79	8.48	7.93
63	8.79	8.49	8.20	7.68
64	8.46	8.19	7.92	7.43
65	8.13	7.88	7.63	7.18
66	7.79	7.56	7.33	6.91
67	7.45	7.24	7.02	6.64
68	7.10	6.91	6.75	6.36
69	6.75	6.57	6.39	6 07
70	6.38	6.22	6.06	5.77
71	6.01	5.87	5.72	5.47
72	5.63	5.51	5.38	5.15
73	5.25	5.14	5.02	4.82
74	4.85	4.77	4.66	4.49
75	4.45	4.38	4.29	4.14
76	4.05	3.98	3.91	3.78
77	3.63	3.57	3.52	3.41
78	3.21	3.16	3.11	3.03
79	2.78	2.74	2.70	2.64
80	2.34	2.31	2.28	2.23

There are a great many uſeful queſtions the determination of which depends o the value of annuities for lives, joi lives, ſucceſſive lives, *&c.* for which refer to Mr. De Moivre's doctrine chances and annuities for lives, and tha here only give the ſolution of a few, being of moſt frequent uſe.

1. The values of two ſingle lives bein giv

given, to find the value of an annuity granted for the time of their joint continuance; or, the value of two ſingle lives being given, to find the value of the joint lives.

Multiply together the values of the two lives, and reſerve the product. Let that product be again multiplied by the intereſt of 1l. and let that new product be ſubtracted from the ſum of the values of the lives, and reſerve the remainder. Divide the firſt quantity reſerved by the ſecond, and the quotient will expreſs the value of the two joint lives.

Thus, ſuppoſing one life of 40 years of age, the other of 50, and intereſt at 5 *per cent.* the value of the firſt life will be found in the tables to be 11.83; the value of the ſecond 10.35; and the product will be 122.4405, which product muſt be reſerved. Multiply this again by the intereſt of 1l; that is, by 0.05, and this new product will be 6.122025; which being ſubtracted from the ſum of the values of the lives, or 22.18, the remainder will be 16.057975, and this is the ſecond quantity reſerved. Now dividing the firſt quantity reſerved by the ſecond, the quotient will be 7.62 nearly; and this expreſſes the value of the two joint lives.

2. The values of two ſingle lives being given, to find the value of an annuity upon the longeſt of them; that is, of an annuity to continue ſo long as either of them is in being.

From the ſum of the values of the joint lives, ſubtract the value of the joint lives, and the remainder will be the value of the longeſt.

Suppoſe, for inſtance, two lives, one worth 13 years purchaſe, the other 14, and intereſt at 4 *per cent.* The ſum of the values of the lives is 27; the value of the two joint lives, by the rule before given, is 9.23; and ſubtracting 9.23 from 27, the remainder 17.77 is the value of the longeſt of the two lives.

3. The values of three ſingle lives being given, to find the value of an annuity upon the longeſt of them:

Take the ſum of the three ſingle lives, from which ſum ſubtract the ſum of all the joint lives combined two and two; then to the remainder add the value of the three joint lives, and the reſult will be the value of the longeſt of the three lives.

Thus, ſuppoſing the ſingle lives to be 13, 14, and 15 years purchaſe, the ſum of the values will be 42; the value of the firſt and ſecond joint lives is 9.24; of the firſt and third, 9.65; of the ſecond and third, 10.18; the ſum of all which is 29.07; which being ſubtracted from the ſum of the lives, that is, from 42, the remainder will be 12.93; to which adding the value of the three joint lives 7.41, the ſum 20.34 will be the value of the longeſt of the three joint lives.

4. To find the preſent value of a remainder in fee, after a life of a given age. That is, ſuppoſing A to be in poſſeſſion of an annuity for his life; and that B, after the deceaſe of A, is to have the annuity for him and his heirs for ever, to find the preſent value of the remainder; or, as ſome call it, the reverſion.

From the value of the fee ſimple, or perpetuity, ſubtract the value of the life in poſſeſſion; what remains will be the preſent value of the reverſion.

Thus, ſuppoſing that A is 60 years of age; an annuity upon his life, intereſt at 5 *per cent.* would be worth 8.39; which being ſubtracted from the value of the fee, or perpetuity 20, the remainder will be 11.61; which is the preſent value of the expectation of B.

By this rule, the value of an eſtate, ſubject to a jointure, may be determined.

In like manner, ſuppoſing that C were to have an annuity for him and his heirs for ever, after the lives of A and B; then from the perpetuity, or fee ſimple, ſubtracting the value of the longeſt of the two lives A and B, the remainder will expreſs the value of C's expectation.

Thus, ſuppoſing the age of A to be 40, and that of B to be 50, the value of an annuity upon the longeſt of theſe two lives would be found, by the foregoing rules, to be 14.56; and this being ſubtracted from the perpetuity 20, the remainder is 5.44; which is the preſent value of C's expectation.

5. To find the value of an annuity for life, after another annuity for life.

Suppoſe, for inſtance, that A is in poſſeſſion of an annuity for his life, and that B, after the death of A, is to have the annuity for his life only, and that his heir, or repreſentative, is to have nothing in caſe A ſurvives B; what is the value of the life of B after the life of A.

From the preſent value of the life of B, ſubtract the preſent value of the joint lives of B and A, and the remainder will be the value of B's expectation.

LIFFEY, a river of Ireland, which riſes in the county of Wicklow, and diſcharges itſelf into Dublin-bay.

LIGAMENT, in anatomy, a ſtrong compact ſubſtance, ſerving to join two bones together.

A ligament is more flexible than a cartilage, not eaſily ruptured or torn, and does not yield, or at leaſt very little, when pulled.

Some ligaments are deſigned to ſtrengthen the joints, and to ſecure the bones in their ſeveral motions from parting from each other, as happens in luxations; other ligaments ſerve to connect cartilages with bones; and ſome there are which ſtrengthen other parts, beſides the bones and cartilages; of this laſt kind are the annular ligaments, ſo called, not ſo much from their figure as from their uſe, ſerving, like a ring, to bridle the tendons of many muſcles. Some ligaments again are fixed to one or more bones, with different degrees of tenſion, and ſerve on each ſide for the inſertion of muſcles. To theſe may be added, the ligaments commonly termed aponeuroſes; ſuch as thoſe of the temples, ſcapula, os humeri, ulna, palm of the hand, thigh, leg, and ſole of the foot. Other differences of ligaments may be deduced from their conſiſtence, ſolidity, ſituation and figure; ſome are almoſt cartilaginous, and others have a particular elaſticity, by which they are capable of being drawn out by a ſufficient force, and of contracting again when left to themſelves.

LIGATURE, in ſurgery, is a chord, band or ſtring; or the binding any part of the body with a chord, band, fillet, &c. whether of leather, linnen, &c.

Ligatures are uſed to extend and replace bones that are broken or diſlocated; to tie the patients down in lithotomy and amputations; to tie upon the veins in phlebotomy, or the arteries in amputations, or in large wounds; to ſecure the ſplints that are applied to fractures; to tie up the proceſſes of the peritonæum, with the ſpermatic veſſels in caſtration; and, laſtly, in taking off warts or other excreſcences by ligature. For the manner of uſing them, ſee LITHOTOMY, PHLEBOTOMY, FRACTURE, &c.

LIGHT, *lux*, in phyſiology, certain ſubtile particles of matter, capable of exciting in us the ſenſation of colours.

Light undoubtedly conſiſts of inconceivably ſmall particles of matter, of different magnitudes; which are emitted or reflected from every point in the ſurface of a luminous body in right lines, and in all directions, with an unparalled velocity; and whoſe power or intenſity decreaſes as the ſquares of the diſtance increaſe.

That light is a material ſubſtance, appears from its being propagated in time, and from its acting upon and producing great alterations in other bodies; but that its particles are inconceivably ſmall appears from hence, that the greateſt quantity of flame is found to have ſcarce any ſenſible gravity or weight: alſo becauſe theſe particles pervade the pores of all tranſparent bodies, however hard or heavy. Yet ſmall as they are, we find the rays of light conſiſt of different ſorts of theſe particles; and that this difference ariſes from their different magnitudes, ſeems evident from the different directions the ſeveral ſorts of rays move in, after they have paſſed through a body of glaſs, water, &c. of ſome ſpecial figure, eſpecially that of a priſm. See the article COLOUR.

The divine wiſdom and providence appear, perhaps, in nothing ſo remarkably as in the extreme ſubtilty of the particles of light: without this qualification it could not have pervaded the pores of bodies, and ſo we could have had none of thoſe which we call diaphanous or tranſparent ſubſtances, and every thing but the ſurface of a body would have been concealed from the ſight of mankind. Again, the velocity of a body is always as the quantity of matter inverſely; and, therefore, the ſmaller the body, the greater velocity it is ſuſceptible of from the ſame force; whence it comes to paſs that light is thus qualified to be tranſmitted through immenſe diſtances in a ſmall and inſenſible part of time; which thing was quite neceſſary, according to the preſent frame and ſtate of nature.

But, laſtly, it was abſolutely neceſſary that the particles of light ſhould be ſo exceeding ſmall, that, when compounded with its velocity, it ſhould produce no ſenſible force, as it muſt otherwiſe have done, and which, therefore, could not have been borne by the tender and delicate texture of the ſeveral parts of vegetable and animal bodies. To give an example: the velocity of a particle of light is found to be at the rate of

8976000

BRITISH MUSEUM

Fig. 1. LICHENS, *LIVERWORTS*

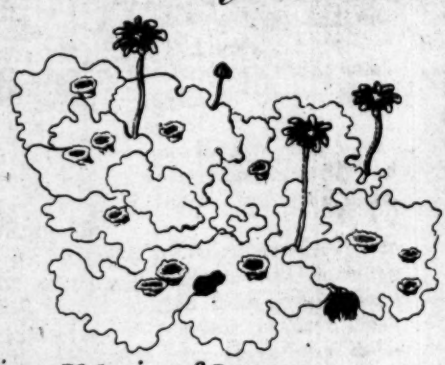


Fig. 2. Velocity of LIGHT.

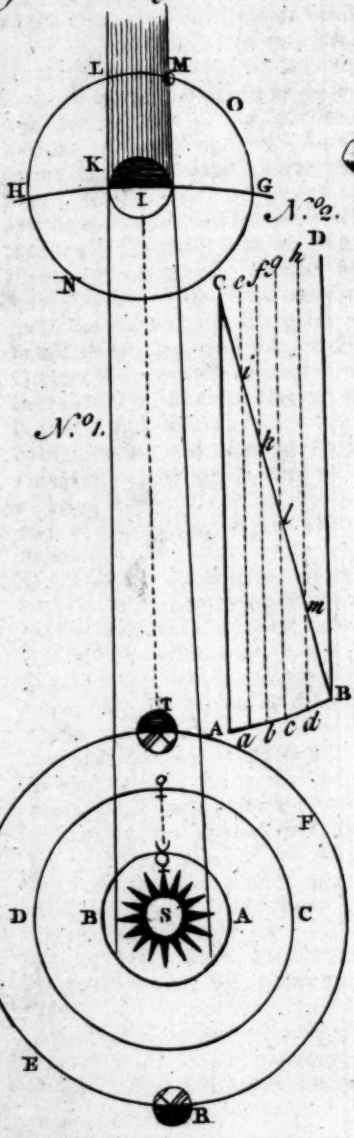
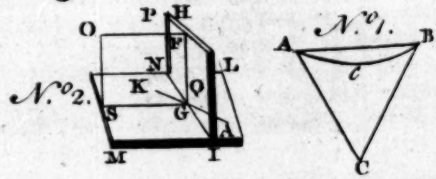


Fig. 3. The LILLY.

Fig. 4.
LIGULATED.

Fig. 5. LIGUSTRUM.

Fig. 6. LINE.



T. Jeffreys sculp.

897600000 feet *per* ſecond; ſuppoſe its matter to be but one millionth part of a grain, then its force to ſtrike an object would be as $\frac{897600000}{1000000} = 897,6$ feet *per* ſecond for one grain; or it would ſtrike with the ſame force that one grain weight would do falling from half the height, *viz.* through 448,8 feet; which we ſhould find to be very great, was the experiment to be made on the ſenſible coats of the eye.

Since the weight of bodies is proportional to the quantity of matter, it follows, that, where the latter is diminiſhed indefinitely, the former will be ſo too; therefore, the weight of light muſt be inſenſible to ever ſo great a quantity of it. Dr. Boerhaave cauſed a globe of iron, twelve inches in diameter, to be heated red-hot, and ſuſpended at the end of a very exact ballance, and counterpoiſed by weights at the other end very nicely, and thus let it hang till all the particles of heat or light were eſcaped, when he found the equilibre of the ballance no ways altered; which plainly proves the above theſis. See the article FIRE.

That the particles of light have not only magnitude, but that in different degrees alſo, is another, and perhaps the moſt ſubtile, diſcovery of the Newtonian philoſophy. The comparative terms of greater and leſſer are now as applicable to the particles of light, as to any other bodies. This is abſolutely proved by the different refrangibility they are found to have in paſſing through a priſmatic figure of glaſs or water; for the power of the priſm detains the iſſuing particle, and draws it a little towards the ſurface; and, ſince this power is the ſame, it would have the ſame effect on all the particles of light, if they were all of an equal magnitude, becauſe they have all an equal velocity. But ſince this effect is different among the particles, ſome being detained and drawn aſide to a greater diſtance than others, it follows, they muſt be leſs in magnitude, to become more ſubject to the influence of the attracting ſurface; in like manner as the electric effluvia will act upon and agitate very ſmall and light bodies, much ſooner and more eaſily than they can move thoſe which are larger. But of this more when we come to ſpeak of the manner in which this power acts in refracting the rays of light. See REFRACTION.

If light were not reflected from every point in the ſurface of a body in all directions every way, there might be aſſigned a point of ſpace where a ray of light, from ſuch a point in the ſurface, does not come; and there the ſaid point of the ſurface could not be viſible: but becauſe the eye can find no point of ſpace in all the viſible hemiſphere reſpecting that point, but where it is viſible; therefore a ray of light is reflected from that point to every part of ſpace, from whence a right line to that point can be drawn.

That the rays of light proceed in a right-lined direction, is evident from hence, that whatever the figure of the body be, if it be held perpendicular to the rays of light, it will always caſt a ſhadow of the ſame figure againſt a parallel plane. Thus a circle will produce a circular ſhadow, a triangle a triangular one, and ſo on. Which plainly ſhews that the rays of light paſs by the extremities of theſe bodies in right-lined directions, excepting theſe only which paſs contiguous to the edges of the body; for they will be a little inflected, which will cauſe the extremity of the ſhadow to be not ſo diſtinct and well defined as it otherwiſe would be; of which we ſhall take farther notice hereafter.

As all the other affections of light, ſo that of its velocity was utterly unknown to all the antient, and moſt of the modern philoſophers, who, before the time of Mr. Romer, were of opinion that the motion of light was inſtantaneous, or that it was propagated through immenſe ſpaces in an inſtant. But Mr. Romer, and other philoſophers, about this time, making frequent obſervations on the eclipſes of Jupiter's moons, found that the time of theſe eclipſes did not correſpond to the calculations founded upon the aſtronomical tables; where the times are all calculated for the diſtance of the center of the ſun, and conſequently where the eye of the ſpectator muſt be ſuppoſed to be in viewing the ſaid eclipſes, occultations, *&c.* of jupiter's moons. To illuſtrate this matter, let S (plate CLVIII. fig. 2. n° 1.) be the center of the ſun, A B the orbit of mercury, C D the orbit of venus, E F that of the earth, and G H a part of the orbit of jupiter. Let I be the body of jupiter, and K L its ſhadow; O M N the orbit of one of jupiter's moons, M juſt entering the ſhadow of jupiter. Now a ſpectator at S would

would obſerve the moon M to enter the ſhadow, juſt at the time which is calculated from the tables: but a ſpectator on the earth, at T, always obſerves it to happen ſooner; and, when the earth is in the oppoſite part of its orbit R, he will always obſerve it to happen later, by the ſpace of about ſeven minutes, in both caſes. This obſervation gave the firſt proof that light was progreſſive, and took up about fourteen minutes to paſs over the diameter of the earth's orbit from T to R, or ſeven minutes to paſs from the ſun S to the earth T.

But this, though a ſufficient diſcovery or proof of the progreſſive motion of light, was yet but an experiment in the groſs, and not accurate to determine or define the true rate of velocity which properly belonged to light: the ſolution of this noble problem was reſerved for Dr. Bradley, who by reiterated and certain experiments, obſerved, that the bright ſtar in the head of draco appeared 39″ more northerly in September than in March, juſt the contrary way to what it ought to appear by the annual parallax of the ſtars, which muſt ariſe from the velocity of light bearing ſome proportion to that of the annual motion of the earth, and is called aberation of light. See STAR.

To illuſtrate this, and from thence to determine the velocity of light; let AB (*ibid.* n° 2.) repreſent a part of the earth's annual orbit, and let C be a ſtar obſerved by a ſpectator at the earth at A; when the earth arrives at B, the ſtar will not be obſerved at C, as before, but at D in the line BD parallel to AC; for let AB be divided into equal parts A *a*, *ab*, *bc*, *cd*, and *d*B; then through theſe points draw the lines *ae*, *bf*, *cg*, *dh*, parallel to AC and DB. Now let the velocity of the earth be to that of the light as AB to CB. When the earth ſets out from the point A, ſuppoſe the ray of light commences its motion from the ſtar at C in the direction CB perpendicular to AB; then it is plain, when the earth is arrived at *a*, the particle of light will be got to *i*, the point where *ae* cuts BC, and the ſtar will be ſeen in the direction *ai* and appear at *e*. In like manner, when the earth is at *b*, the particle of light will be come to *k*, and will appear at *f*, and ſo on; when the earth is at *c*, *d*, B, the particle will be at *l*, *m*, and B, and the ſtar will appear at *g*, *h*, and D. If therefore the line CA repreſents the axis of a teleſcope, making the angle BAC with the direction of the earth's motion AB; when the ſpectator comes to B, he will ſee the ſtar at D, which he could not do, if the teleſcope was directed in the perpendicular line BC; but the difference of the poſitions of the lines DB and BC, or the angle DBC, is ſo very ſmall as to amount to no more than 20″ 15‴, which gives the proportion of the ſides BC to CD or AB, as 10210 to 1; which ſhews that the velocity of light is 10210 times greater than the velocity of the earth in her orbit. But the velocity of the earth is known, which is about 500,000,000 miles in 365 days, or about 56,000 miles *per* hour; whence the velocity of light will be found to be ſuch as carries it through the ſpace of 170,000 miles, or 897,600,000 feet in one ſecond; and, therefore, it will paſs from the ſun to us in 8′ and 13″.

If a cannon will throw a ball one mile perpendicular height, or 5280 feet, the velocity with which it goes from the cannon's mouth is the uniform velocity of 10,560 feet *per* 18¼″, (which is the time of the perpendicular aſcent or deſcent) and, therefore, the velocity of the cannon-ball is 578 feet *per* ſecond. Whence the velocity of light is, to that of the cannon-ball, as 897,600,000 to 578, or as 1,550,000 to 1, nearly.

The doctor found that the parallax of the fixed ſtars, inſtead of amounting to many ſeconds, as ſome have deduced from their obſervations, does not make one ſecond; and from thence it follows that the abovementioned ſtar, in draco, is about 400,000 times farther from us than the ſun; and, conſequently, that the light takes up above 493″ × 400,000 = 197,200,000 ſeconds (which is more than ſix years) in coming from that ſtar to us.

For the properties of reflected and refracted light, ſee the articles REFLECTION and REFRACTION.

LIGHT, is alſo uſed to denote the diſpoſition of objects, with regard to the receiving of light: thus, the doors, windows, &c. of houſes, are called lights.

For the lights and ſhades of paintings, &c. ſee CLARO-OBSCURO.

LIGHT, in the manege, a term uſed in various ſenſes: thus a light horſe, is a ſwift runner: but the ſame term is alſo given to a horſe that is well made, tho' he is neither ſwift nor active; for we

here conſider only the ſhape and make of the horſe, without regard to his qualities. We call a coach-horſe light, when he ſtirs nimbly and dreads the whip. In this ſenſe, all light coach-horſes are good; and a hard heavy coach-horſe, that takes the laſhing eaſily, is good for nothing. For light upon the hand, and light-horſe, ſee HAND and HORSE.

LIGHT-HOUSE, in maritime affairs, a building on the ſea-ſhore, a promontory, a rock, &c. wherein is kept a light, during the night, in order to direct veſſels ſailing near the place.

LIGHTENING, in phyſiology, the burſting of fire from a cloud.

From repeated experiments, it appears, that lightening is only electrical fire drawn off from the clouds: and, in effect, this electricity has been collected during thunder in iron-bars, or in tin-tubes, in many parts of Europe. See the article ELECTRICITY.

Thunder then, or lightening, is in the hand of nature, what electricity is in ours; the wonders which we now exhibit at pleaſure, are only little imitations of thoſe great effects which frighten us. A cloud prepared by the action of winds, by heat, by a mixture of exhalations, &c. is the electriſed body; and watery clouds, or terreſtrial matter, the non-electrics which excite it. See the article THUNDER.

The dreadful effects of lightening, as killing men and other animals, demoliſhing houſes, ſplitting trees, &c. are too well known to be inſiſted on here. It has alſo been known to render iron magnetical, and to reverſe the polarity of needles; and the ſame effects may be produced by electricity; and indeed, ſays the abbe Nollet, the univerſality of the electric matter, the readineſs of its action, its inflammability, its property of ſtriking bodies both externally and internally, even to their ſmalleſt parts, and of giving fire to them; all theſe points of analogy make it probable that lightening and electricity are owing to the ſame cauſes.

LIGHTER, in naval architecture, a large kind of boat, uſed in the river of Thames for carrying heavy goods, as coals, timber, &c.

LIGHTNESS, or LEVITY OF BODIES. See the article LEVITY.

LIGNICENSIS *terra*, in the materia medica, the name of a fine yellow bole, dug in many parts of Germany, particularly about Emeric in the circle of Weſtphalia, and uſed in cordial and aſtringent compoſitions. It is a common ſuccedaneum for the yellow ſileſian bole, where that is not to be had, and is generally eſteemed very nearly, if not abſolutely, equal to it in its virtues. It is moderately heavy, naturally of a ſmooth ſurface, and of a beautiful gold-colour. It eaſily breaks between the fingers, and does not ſtain the ſkin in handling, and melts freely in the mouth, but generally leaves a little grittineſs between the teeth. It makes no effervеſcence with acids; and burns not to a red, but to a pale brown, and almoſt to a ſtone hardneſs. Charlton ſays it is more frequently known by the name of terra ſigillata golthergenſis.

LIGULATED, among botaniſts, an appellation given to ſuch floſcules as have a ſtraight end turned downwards, with three indentures, but not divided into ſegments. See plate CLVIII. fig. 4.

LIGUSTICUM, LOVAGE, in botany, a genus of the pentandria digynia claſs of plants, the general corolla of which is uniform, and the ſingle flowers conſiſt each of five lanceolated petals, bent inwards at the points: the fruit is naked, oblong, angulated, ſulcated, and ſeparable into two parts; and containing two oblong, ſmooth ſeeds, plain on one ſide, and ſtriated on the other.

Under this genus are comprehended the ſiler, cicutaria, and leviſticum of authors. The root and ſeeds of lovage are accounted carminative, aromatic, and ſudorific; and preſcribed with ſucceſs in malignant fevers, colics, apoplexies, and diſorders of the head.

LIGUSTRUM, PRIVET, in botany, a genus of trees, belonging to the diandria monogynia claſs of plants, with a funnel-faſhioned flower, quadrifid or quinquifid at the limb: the fruit is a globoſe, ſmooth berry, with only one cell, containing four ſeeds convex on one ſide, and angulated on the other. See plate CLVIII. fig. 5.

Privet leaves and ſeeds are eſteemed cooling, drying, and aſtringent; and therefore recommended in putrid diſorders of the gums, inflammations, and the like.

LIKE, in geometry, &c. denotes the ſame as ſimilar. See the article SIMILAR.

LILIACEOUS, an appellation given to ſuch flowers, as reſemble that of the lily. See the article LILY.

LILIUM, the lily. See the next article.

LILY, LILIUM, in botany, a genus of the

the hexandria monogynia claſs of plants, with a campanulated flower, riſing narrow out of the cup, and expanding towards the limb: it conſiſts of ſix erect petals, obtuſe at the points, which are bent backwards; the fruit is an oblong capſule, with three cells, in which are contained a great many ſmall ſeeds. See plate CLVIII. fig. 3.

White lily-roots are emollient, and ſuppurative; being uſed with ſucceſs in cataplaſms, intended for theſe purpoſes. The flowers are alſo emollient and anodyne. They are only uſed externally, and that either in the form of a cataplaſm, or of an oil by inſolation.

LIMA, a province of Peru, in South America; the capital of which, called alſo Lima, was almoſt entirely deſtroyed by an earthquake, in 1746: weſt long. 76°, and ſouth lat. 12° 30′.

LIMALE, a town of Brabant, thirteen miles ſouth-weſt of Bruſſels.

LIMAX, the ſnail, in zoology, the animal that inhabits the murex-ſhell. See the articles SNAIL and MUREX.

LIMB, in a general ſenſe, denotes the border or edge of a thing; thus, we ſay, the limb of a quadrant, of the ſun, of a leaf, *&c.*

LIMB, in anatomy, an appellation given to the extremities of the body, as the arms and legs. See ARM and LEG.

LIMB, *limbus*, in the church of Rome, is uſed in two different ſenſes. 1. The limb of the patriarchs is ſaid to be the place, where the patriarchs waited the redemption of mankind: in this place, they ſuppoſe our Saviour's ſoul continued from the time of his death to his reſurrection. 2. The limb of infants, dying without baptiſm; a place ſuppoſed to be diſtinct both from heaven and hell; ſince, ſay they, children dying innocent of any actual ſin do not deſerve hell; and by reaſon of their original ſin cannot be admitted into heaven.

LIMBER-HOLES, little holes cut thro' the floor-timbers of a ſhip, ſerving to convey the bildge-water to the pump.

LIMBURG, the capital of a dutchy of the ſame name, in the Auſtrian Netherlands, twenty miles ſouth-eaſt of Liege: eaſt long. 6° 5′, and north lat. 50° 37′.

LIME, *calx*, a ſoft, friable, ſubſtance obtained by calcining or burning ſtones, ſhells and the like.

There are ſo many ſpecies of ſtone capable of being burnt into lime, and ſo many that in the different parts of the world are really put to that uſe, that it would be difficult to affix any particular idea to the term lime-ſtone; but we are to underſtand by it in general, any ſtone that upon a proper degree of heat continued a ſufficient time, becomes a white calx, which will make a great ebullition and noiſe on being thown into water, and will, in fine, fall into a looſe white powder at the bottom of that liquor, after having very ſtrongly impregnated it with its ſoluble particles. The moſt common kind of lime-ſtone, is a greyiſh or bluiſh ſtone, found in looſe maſſes and often veined with red: marble, alabaſter, and all the ſtones that have ſpar for their baſis, may alſo come under the general denomination of lime-ſtone, ſince they all burn into lime. In general, every ſtone, of whatever kind or colour, that will ferment with aqua fortis, will alſo burn into lime, and it is of no conſequence to the medicinal uſe of that calx whether it be made of the one or the other of theſe ſtones. What lime we have in London is made of chalk, which is weaker than that made of ſtone; but it is otherwiſe the ſame.

The kilns uſed for making lime, are commonly built in a large pit; they are wide at the top, and grow narrow by degrees, as they approach nearer to the bottom: on the outſide, near the bottom of the kiln, there is door, at which the aſhes are taken out, and juſt above that an iron-grate: upon this is placed a layer of ſtone, or whatever elſe is to be burnt for making lime, and upon that a layer of wood or coals, which is repeated till the kiln is full, only obſerving, that the outmoſt layer muſt be wood or coals. Chalk is commonly burnt in twenty-four hours, but ſtone often takes up fifty hours: ten buſhels of ſea-coal, or a hundred of faggots three feet long, will burn forty buſhels of chalk, and forty buſhels of chalk will yield thirty buſhels of unſlacked lime.

The beſt lime is that made of the hardeſt ſtone; it is not only uſed by architects, builders, plaſterers, dyers, ſugar-refiners, tanners, and many other mechanics, but is an excellent manure for land, where it is ſandy, or a mixed gravel; but it is not fit for a cold gravel or clay ſoil. In many places it is carried out and laid in heaps, allowing a buſhel to a pole ſquare, or a hundred and ſixty buſhels to an acre. The beſt method of ordering it, is to mix it with dung, mud, or

fresh earth, and to spread it to over the earth the year before it is plowed.

Lime is also of great service in medicine, for which use, it is to be chosen in clean, bright, and hard pieces, but not stony, such as will not easily crumble to pieces between the fingers, and yet will readily break when thrown into water. The best lime in the world, on being long exposed to a damp air, will moulder into a powder, and lose all its medicinal virtues. Lime in its perfect and unaltered state, as newly taken from the kiln, is called calx viva, or quick-lime: that which has lain in the air till it has fallen into powder, is called calx extincta; and that which has been thrown into water, and the powder it has fallen into afterwards washed with several fresh waters, is called calx lota.

Quick-lime is burning and corrosive, and is never given internally; but it is sometimes used in external applications, as made into a paste with orpiment, soap, &c. and used as a depillatory. The calx lota is no longer a corrosive, but a powerful deiccative; and lime-water is of great service internally in all cutaneous eruptions, in the cure of obstinate ulcers, and for diseases of the lungs: for this purpose it is generally to be continued a considerable time.

The preparations of lime in use in the shops are, the simple lime-water; the less compound lime-water; the more compound lime-water; and several kinds of caustics, which see under the article CAUSTIC.

Simple lime-water is made in the following manner: Put a pound of quick lime into a large earthen-pan; pour upon it, by a little at a time, a gallon and a half of water; after the ebullition is thoroughly over, let the liquor stand to settle, and then pour it clear off, and filter it for use. This is principally intended for washing old ulcers, and other external purposes; when it is to be taken internally, the following additions are made to it, to take off its flavour, or to add to its virtues. Take of liquorice-root, an ounce; of sassafras-bark, half an ounce; simple lime-water, three quarts; let the whole infuse together for two days without heat, then filter it for use: this last preparation is called the less compound lime-water. The more compound lime-water is made thus: Take raspings of guaiacum, half a pound; liquorice-root, an ounce; sassafras-bark, half an ounce; of coriander-seed, three drams; of lime-water three quarts; let the whole stand together two days without heat, and then filter it off for use.

It has been found by several late experiments, made by Dr. Alston, that lime-water is an excellent remedy for the stone; and that it has also been given with extraordinary success in acute fevers. Sponius says, that when drank with milk or whey, it performs wonderful effects in internal ulcers, diarrhœas, and the dysentery.

Lime-water on being mixed with linseed-oil, or the oil of olives, and well shaken, acquires the consistence of a balsam, which is of a singular service when applied externally in fresh burns, and also conduces to stop inflammations. It may also be impregnated with copper, by standing in a brazen bason: by which means it assumes a beautiful saphire colour, and proves an excellent remedy against pustules, ulcers, scabies, and itching of the eyes; and this last preparation mixed with a little sal ammoniac, is recommended against all humours, films, and other blemishes of the eyes, and is said to be very efficacious when the eyes are hurt by the small-pox; and there is no remedy more effectual for cancerous ulcers.

Bird-LIME. See the article BIRD-LIME.

LIME-PHOSPHORUS. See PHOSPHORUS.

LIME TREE, the english name of the tilia. See the article TILIA.

LIMERIC, the capital of a county of the same name in Ireland, situated on the river Shannon, fifty-two miles north of Cork: west long. 8° 30′, north lat. 52° 35′.

LIMINGTON, or LEMINGTON, a borough-town of Hampshire, twelve miles south-west of Southampton. It sends two members to parliament.

LIMIT, in a restrained sense, is used by mathematicians for a determinate quantity to which a variable one continually approaches; in which sense, the circle may be said to be the limit of its circumscribed and inscribed polygons. In algebra, the term limits is applied to two quantities, one of which is greater, and the other less, than another quantity; and in this sense it is used, in speaking of the limits of equations, whereby their solution is much facilitated.

Let any equation, as $x^3 - px^2 \times qx - r = o$ be proposed; and transform it into

the following equation. See the article TRANSFORMATION.

$$\left.\begin{array}{r} y^3+3ey^2+3e^2y+e^3 \\ -py^2-2pey-pe^2 \\ +qy+qe \\ -r \end{array}\right\} = 0,$$

Where the values of y are leſs than the reſpective values of x, by the difference e. If you ſuppoſe e to be taken ſuch as to make all the coefficients of the equation of y poſitive, *viz.* e^3-pe^2+qe-r, $3e^2-2pe+q$, $3e-p$; then there being no variation of the ſigns in the equation, all the valves of y muſt be negative; and conſequently the quantity e, by which the valves of x are diminiſhed, muſt be greater than the greateſt poſitive value of x: And, conſequently, muſt be the limit of the roots of the equation $x^3-px^2+qx-r=0$.

It is ſufficient therefore, in order to find the limit. to enquire what quantity ſubſtituted for x, in each of theſe expreſſions x^3-px^2+qx-r, $3x^2-2px+q$, $3x-p$, will give them all poſitive; for the quantity will be the limit required.

Having found the limit that ſurpaſſes the greateſt poſitive root, call it m. And if you aſſume $y=m-x$, and for x ſubſtitute $m-y$, the equation that will ariſe will have all its roots poſitive; becauſe m is ſuppoſed to ſurpaſs all the values of x, and conſequently $m-x$ $(=y)$ muſt always be affirmative. And, by this means, any equation may be changed into one that ſhall have all its roots affirmative.

Or, if $-n$ repreſent the limit of the negative roots, then by aſſuming $y=x+n$ the propoſed equation ſhall be tranſformed into one that ſhall have all its roots affirmative; for $+n$ being greater than any negative value of x, it follows that $y=x+n$ muſt be always poſitive.

What is here ſaid of the above cubic equation, may be eaſily applied to others; and of all ſuch equations, two limits are eaſily diſcovered, *viz.* 0, which is leſs than the leaſt; and e, found as above, which ſurpaſſes the greateſt root of the equation. But beſides theſe, other limits ſtill nearer the roots may be found; for the method of doing which, the reader may conſult Maclaurin's Algebra, p. 175, ſeq.

LIMITS *of a planet*, its greateſt excurſion from the ecliptic, or, which is the ſame thing the points of its greateſt latitude.

LIMITATION, in law, ſignifies a certain ſpace of time allowed for bringing actions in. Thus by the ſtatute of the 21 Jac. I. c. 16. it is ordained, that all writs of formedon, &c. for title to lands in being, muſt be ſued out within twenty years after the title aroſe, and actions of debt upon the caſe, actions upon a ſtated account, of detinue, trover and treſpaſs, muſt be commenced within ſix years after the cauſe of action, and not afterwards: actions of aſſault and battery muſt be brought within four years after the cauſe of action; and for ſlander, within two years. Though an action may be barred by ſtatute, yet a freſh promiſe will revive it. It is ſaid, that twenty years poſſeſſion of land is a good title in a perſon to maintain an action of ejectment, though he be not at that time actually poſſeſſed thereof: but where the plaintiff is out of poſſeſſion more than ſuch a number of years, it will bar him the ſtatute. See PRESCRIPTION.

LIMITATION OF ESTATE, is the length of time an eſtate is to continue in the poſſeſſion of a perſon or family. As where a perſon grants lands to a perſon and his heirs male, and on default of ſuch iſſue, to his heirs female; here the daughters cannot inherit ſo long as there is a male heir, becauſe the eſtate is firſt limited to the heirs male.

LIMITED PROBLEM, a problem that admits but of one ſolution, as to make a circle paſs through three given points not lying in the ſame right line. See the article PROBLEM.

LIMMA, in muſic, an interval in the ſcale of the antients, expreſſed by $\frac{256}{243}$. See the article INTERVAL.

LIMNING, the art of painting in water-colours, in contradiſtinction to painting which is done in oil-colours. See the article PAINTING.

Limning is by far more antient than painting in oil; this laſt being firſt invented by John Van Eyck, a flemiſh painter, in 1410.

In limning, all colours are proper enough except the white, made of lime, which is only uſed in freſco. The azure and ultramarine muſt always be mixt with ſize or gum: but there are always applied two lays of hot ſize, before the colours are laid on: the colours are all ground in water, each by itſelf, and as they are required in working, are diluted with ſize-water.

When the piece is finiſh d, they go over it with the white of an egg, well beaten, and then with varniſh, if required.

To limn or draw a face in colours: having all the materials in readineſs, lay the prepared colour on the card even and thin, free from hairs and ſpots, over the place where the picture is to be. The ground being laid and the party placed in a due poſition, begin the work, which is to be done at three ſittings; at the firſt, you are only to dead colour the face, which will require about two hours. At the ſecond ſitting, go over the work more curiouſly, adding its particular graces or deformities. At the third ſitting, finiſh the whole; carefully remarking whatever may conduce to render the piece perfect, as the caſt of the eyes, moles, ſcars, geſtures, and the like.

LIMODORUM, in botany, a genus of the gynandria-diandria claſs of plants, the flower of which conſiſts of five oblong petals, and the nectarium hollow, and formed of a ſingle leaf: the fruit is a columnar unilocular capſule, containing a great number of very ſmall ſeeds.

LIMOGES, a city of France, a hundred miles north-eaſt of Bourdeaux.

LIMON, the LEMON TREE, is made by Linnæus a ſpecies of citrus. See CITRUS.

LIMOSELLA, in botany, a genus of the didynamia-angioſpermia claſs of plants, the flower of which conſiſts of one erect petal, divided into five ſegments; and its fruit is an unilocular capſule, containing a great many ſeeds.

LIMPET, the engliſh name of a ſhell-fiſh, called by authors patella. See PATELLA.

LINARIA, the LINNET in ornithology. See the article LINNET.

LINCOLN, the capital city of the county of Lincoln; weſt long. 27′, north lat. 53° 16′. It ſends two members to parliament.

LINDSEY, the north diviſion of Lincolnſhire.

LINE, *linea*, in geometry, a quantity extended in length only, without any breadth or thickneſs. It is formed by the flux or motion of a point. See FLUXION. There are two kinds of lines, *viz.* right lines and curve lines. If the point A, (pl. CLVIII. fig. 6. n° 1.) move towards B; by its motion, it deſcribes a line, and this, if the point go the neareſt way towards B, will be a right or ſtraight line, whoſe diſtinction therefore is the neareſt or ſhorteſt diſtance between any two points; or a line, all whoſe points tend the ſame way. If the point go any way about, as in one of the lines A B C, or A c B, it will trace out either a crooked line, as the upper A c B, or elſe two more ſtraight ones, as in the lower A C B. Right lines are all of the ſame ſpecies, but curves are of an infinite number of different ſpecies. We may conceive as many as there may be different ratios between their ordinates and abſciſſes. See the articles ACSCISS and ORDINATE.

Curve lines are uſually divided into geometrical and mechanical; the former are thoſe which may be found exactly in all their points; the latter are thoſe, ſome or all of whoſe points are not to be found preciſely, but only tentatively, or nearly.

Curve lines are alſo divided into the firſt order, ſecond order, third order, &c. See the article CURVE.

Lines conſidered as to their poſitions, are either parallel, perpendicular, or oblique, the conſtruction and properties whereof ſee under PARALLEL, &c.

Euclid's ſecond book treats moſtly of lines, and of the effects of their being divided and again multiplied into one another.

LINE, in geography, the ſame with equator. See the article EQUATOR.

LINES in aſtronomy, are, 1. Fiducial line, the line or ruler which paſſes thro' the middle of an aſtrolabe, or the like inſtrument, and on which the ſights are fitted, otherwiſe, called alhidade, index, dioptra, and medeclinium. See the article ASTROLABE. 2. The horizontal line. 3. Iſochronal line. 4. Meridian line. 5. Line of the nodes. See the articles HORIZONTAL, ISOCHRONAL, MERIDIAN and NODES.

LINES in perſpective, are, 1. Geometrical line, which is a right line drawn in any manner on the geometrical plane. 2. Terreſtrial line, or fundamental line, is a right line wherein the geometrical plane, and that of the picture or draught interſect one another, ſuch is the line N I, (plate *ibid.* n° 2.) formed by the interſection of the geometrical plane L M, and the perſpective plane H K. 3. Line of the front, is any right line parrallel to the terreſtrial line. 4. Vertical line, the common ſection of the vertical and of the draught. 5. Viſual line, the line or ray imagined to paſs from the object to the eye. 6. Line of ſtation, according to ſome writers, is the common ſection of the vertical and geometrical planes. Others, as Lamy, mean by it the perpendicular height of the eye above the geometrical plane. Others a line on that plane, and perpendicular to the line ex-

preſſing the height of the eye. 7. Objective line, the line of an object from whence the appearance is ſought for in the draught or picture.

LINE *of diſtance*. See the article DISTANCE.

LINES, in dialling, are, 1. Horizontal line, the common ſection of the horizon and the dial-plane. See DIAL. 2. Horary lines, or hour-lines, the common interſections of the hour-circles of the ſphere, with the plane of the dial. See HORARY. 3. Subſtylar line, that line on which the ſtyle or cock of a dial is duly erected, and the repreſentation of ſuch an hour-circle as is perpendicular to the plane of that dial. 4. Equinoctial line, the common interſection of the equinoctial and plane of the dial.

Contingent LINE, See CONTINGENT.

LINE *of meaſures*, is uſed by Oughtred, to denote the diameter of the primitive circle in the projection of the ſphere in plano, or that line in which the diameter of any circle to be projected falls. In the ſtereographic projection of the ſphere in plano the line of meaſures is that line in which the plane of a great circle perpendicular to the plane of the projection, and that oblique circle which is to be projected, interſects the plane of the projection; or it is the common ſection of a plane paſſing through the eye-point and the center of the primitive at right angles to any oblique circle which is to be projected, and in which the center and pole of ſuch circle will be found.

LINE *of direction* on the earth's axis, in the pythagorean ſyſtem of aſtronomy, the line connecting the two poles of the ecliptic and of the equator when they are projected on the plane of the former.

LINE *of direction*, in mechanics, that wherein a body actually moves, or would move, if it were not hindered. It alſo denotes the line that paſſes thro' the center of gravity of the heavy body to the center of the earth, which muſt alſo paſs thro' the fulcrum, or ſupport of the heavy body, without which it would fall.

LINE *of gravitation*, of any heavy body, a line drawn through its center of gravity, and according to which it tends downwards.

LINE *of the ſwifteſt deſcent*, of a heavy body is the cycloid. See CYCLOID.

LINE *of a projectile*. See PROJECTILES.

LINES *on the plain ſcale*, are the line of chords, line of fines, line of tangents, line of ſecants, line of ſemitangents, line of leagues; the conſtruction and application of which ſee under the words SCALE, SAILING, *&c.*

LINES *on Gunter's ſcale*, are the line of numbers, line of artificial ſines, line of artificial tangents, line of artificial verſed ſines, line of artificial ſines of rhumbs, line of a artificial tangents of the meridian line, and line of equal parts; for the conſtruction and application whereof, ſee GUNTER'S SCALE.

LINES *of the ſector*, are the line of equal parts, or line of lines, line of chords, line of fines, line of tangents, line of ſecants, line of polygons, line of numbers, line of hours, line of latitudes, line of meridians, line of metals, line of ſolids, line of planes; for the conſtruction and uſe whereof, ſee the article SECTOR.

LINES, in fortification, are thoſe of approach, capital, defence, circumvallation, contravallation, of the baſe, *&c.* See the articles APPROACH, *&c.*

To LINE *a work*, ſignifies to ſtrengthen a rampart with a firm wall; or to encompaſs a parapet or moat with good turf, *&c.*

LINE, in the art of war, is underſtood of the diſpoſition of an army, ranged in order of battle, with the front extended as far as may be, that it may not be flanked. See the article ARMY.

LINE *of battle*, is alſo underſtood of the diſpoſition of a fleet on the day of engagement, on which occaſion the veſſels are uſually drawn up as much as poſſible in a ſtraight line, as well to gain and keep the advantage of the wind, as to run the ſame board.

Ship of the LINE, a veſſel large enough to be drawn up in the line, and to have a place in a ſea-fight. See the article SHIP.

LINE, in fencing, that part of the body oppoſite to the enemy, wherein the ſhoulders, the right arm, and the ſword, ought always to be found; and wherein are alſo to be placed the two feet at the diſtance of eighteen inches from each other. In which ſenſe a man is ſaid to be in his line, or to go out of his line, *&c.*

LINE *of demarcation*, or *Alexandrian* LINE, a meridian paſſing over the mouth of the river Moragnon, and by the cape Houmas and Mallabrigo, ſo called from pope Alexander VI. who, to end the diſpute between the crowns of Caſtile and Portugal, about their boundaries, drew an imaginary line on the globe, which was to terminate the pretenſions of each. By this partition, the Eaſt-Indies fell to the ſhare of the Portugueſe, and the Weſt-Indies to the Caſtilians.

LIN

INE *of the Synodical*, in reference to ſome theories of the moon, is a right line ſuppoſed to be drawn through the centers of the earth and ſun: and, if it be produced, quite through the orbits: it is called the *line of the true ſyzygies*: but a right line imagined to paſs through the earth's center, and the mean place of the ſun, is called the *line of the mean ſyzygies*.

INE, in genealogy, a ſeries or ſucceſſion of relations in various degrees, all deſcending from the ſame common father. Direct line, is that which goes from father to ſon; being the order of aſcendants and deſcendants.

Collateral line, is the order of thoſe who deſcend from ſome common father related to the former, but out of the line of aſcendants and deſcendants: in this are placed uncles, aunts, couſins, nephews, &c. See DIRECT and COLLATERAL.

INE alſo denotes a french meaſure, containing the twelfth part of an inch, or the hundred and forty-fourth part of a foot. Geometricians conceive the line ſubdivided into ſix points. The french line anſwers to the engliſh barley-corn. See the articles FOOT, INCH, &c.

INES, in muſic, the name of thoſe ſtrokes drawn horizontally on a piece of paper, on and between which the characters and notes of muſic are diſpoſed: their number is commonly five; when another is added, for one, two, or more notes, it is called a ledger-line.

INES, in heraldry, the figures uſed in armories, to divide the ſhield into different parts, and to compoſe different figures. Theſe lines, according to their different forms and names, give denomination to the pieces or figures which they form, except the ſtraight or plain lines.

INES, among fowlers, is uſed to expreſs the things by which they catch birds.

INEA ALBA, in anatomy, the concourſe of the tendons of the muſcles of the abdomen, extending from the ſternum to the juncture of the oſſa pubis, in form of a broad and ſtrong white ſtreak, and dividing the abdomen into two. See the article ABDOMEN.

INEAMENT, among painters, is uſed for the out-lines of a face. See the article CONTOUR.

INEAR NUMBERS, in mathematics, ſuch as have relation to length only; ſuch is a number which repreſents one ſide of a plane figure. If the plane figure be a ſquare, the linear number is called a root.

LINEAR PROBLEM, that which may be ſolved geometrically, by the interſection of two right lines. This is called a ſimple problem, and is capable but of one ſolution.

LINEN, or LINNEN. See LINNEN.

LING, in ichthyology, the cirrated gadus with two back-fins, and with the upper jaw longeſt; a fiſh called by authors aſellus longus. See the article GADUS.

LINGEN, a town of Germany, in the circle of Weſtphalia, capital of a county of the ſame name, ſituated on the river Ems, forty-five miles north of Munſter.

LINGUATULA, in ichthyology, a ſpecies of pleuronectes. See the article PLEURONECTES.

LINIMENT, *linimentum*, in pharmacy, a compoſition of a conſiſtence ſomewhat thinner than an unguent, and thicker than an oil, uſed for anointing different parts of the body in various intentions.

The materials proper for compoſing of a liniment, are oils, fats, balſams, and whatever enters the compoſition of unguents and plaſters.

The beſt way of uſing liniments, is to apply them after the pores have been opened by frictions or fomentations.

There are many ſorts of liniments directed in pharmaceutical writers; but we ſhall content ourſelves with giving that called linimentum Arcæi, prepared as follows: take of gum elemi, and turpentine of fir, of each an ounce and half; of old and depurated mutton-ſuet, two ounces; of old and depurated hog's lard, an ounce: mix them, and make an ointment.

Oils, unguents, and the fat of animals, or whatever any part is anointed with, are comprehended under the name liniment.

LINLITHGOW, a town of Scotland, in the county of Lothian, capital of the territory of Linlithgow, ſituated ſixteen miles weſt of Edinburgh.

LINNÆA, in botany, a genus of the didynamia-angioſpermia claſs of plants, the corolla of which is monopetalous, turbinated, ſemi-quinquifid, obtuſe, almoſt equal, and greater than double the cup of the flower; the fruit is a roundiſh bilocular berry; the ſeeds are ſolitary and roundiſh.

LINNEN, in commerce, a well known kind of cloth, chiefly made of flax. See FLAX.

In order to ſucceed in the linnen-manufacture, one ſet of people ſhould be confined to the plowing and preparing the ſoil, ſowing and covering the ſeed, to the weeding,

weeding, pulling, rippling, taking care of the new ſeed, and watering and graſſing the flax, till it is lodged at home: others ſhould be concerned in the drying, breaking, ſcrutching, and heckling the flax, to fit it for the ſpinners; and others in ſpinning and reeling it, to fit it for the weaver; others ſhould be concerned in taking due care of the weaving, bleaching, beetling, and finiſhing the cloth for the market. It is reaſonable to believe, that if theſe ſeveral branches of the manufacture were carried on by diſtinct dealers in Scotland and Ireland, where our home-made linnens are manufactured, the ſeveral parts would be better executed, and the whole would be afforded cheaper, and with greater profit. But without entering farther into the nature of this manufacture, we ſhall content ourſelves with giving the bounty on britiſh and iriſh linnens exported, and the duties on thoſe imported from foreign countries; only firſt obſerving that the uſe of all french cambrics and lawns is prohibited in Great Britain, but may be imported upon the importer's making oath that they are intended for exportation only, and giving a bond for the payment of 5 l. for every piece of cambric that ſhall not be exported within the term of three years after being entered. The uſe of callicoes, printed, painted, ſtained, and dyed, and brought from India, Perſia, and China, is alſo prohibited; theſe are to be brought to no port but that of London, where they are to be duly entered, and ſecured in warehouſes, till their exportation.

The exporter of britiſh and iriſh linnens, that are neither ſtriped, chequered, nor made into buckram, who ſends them to Africa, America, Spain, Portugal, Gibraltar, or Minorca, ſhall be allowed $\frac{1}{4}$ d. for every yard of linnen under the value of 5 d. *per* yard; and $1\frac{1}{2}$ d. for every yard of the value of 5 d. and not exceeding the value of 1 s. 6 d.

The principal duties on foreign linnen imported, pay as follow: holland damaſk tabling of the breadth of two ells, and under three ells, pay, on being imported, 5 s. $\frac{60\frac{1}{4}}{100}$ d. the yard; and draw back on exportation 4 s. $6\frac{90\frac{1}{2}}{100}$ d. Ditto, of the breadth of three ells or upwards, pay on importation 7 s. $10\frac{35\frac{1}{2}}{100}$ d. the yard, and draw back on exportation 7 s. $4\frac{65\frac{1}{2}}{100}$ d. Holland diaper, of the breadth of two ells, and under three ells, pay on importation 2 s. $3\frac{27\frac{1}{4}}{100}$ d. the yard, and draw back on exportation 2 s. $\frac{70\frac{1}{4}}{100}$ d. D°, of the breadth of three ells, or upwards, pay on importation 3 s. $6\frac{46}{100}$ d. the yard, and draw back on exportation 3 s. $3\frac{89\frac{1}{2}}{100}$ d. Holland diaper napkins, the dozen, pay on importation 6 s. $6\frac{71\frac{2}{5}}{100}$ d. and draw back on exportation 5 s. $8\frac{45\frac{2}{5}}{100}$ d. Holland diaper towelling and napkining, not exceeding an ell and $\frac{1}{8}$ in breadth, pay on importation $6\frac{56}{100}$ d. the yard; and draw back on exportation $5\frac{70\frac{1}{2}}{100}$ d. Sileſia diaper towelling and napkining, pay on importation $3\frac{47\frac{4}{5}}{100}$ d. the yard; and draw back on exportation $3\frac{9\frac{4}{5}}{100}$ d. Bag, brabant, and brown holland, embden, flemiſh, frieze, gentiſh, iſingham, overyſſel, and rouſe-cloth, not exceeding 1¼ ell engliſh in breadth, pay on importation $10\frac{93\frac{1}{4}}{100}$ d. the ell, and draw back on exportation $9\frac{50\frac{3}{4}}{100}$ d. Ditto, above 1¼ ell and under two ells, pay on importation 1 s. $1\frac{4\frac{1}{5}}{100}$ d. the ell; and draw back on exportation $11\frac{61\frac{3}{5}}{100}$ d. Ditto, of the breadth of two ells, and under three ells, pay on importation 1 s. $3\frac{15\frac{1}{8}}{100}$ d. the ell; and draw back on exportation 1 s. $1\frac{7\frac{7}{8}}{100}$ d. Ditto, of the breadth of three ells or upwards, pay on importation 1 s. $11\frac{58\frac{7}{8}}{100}$ d. the ell, and draw back on exportation 1 s. $10\frac{16\frac{7}{8}}{100}$ d. Hamburgh and ſileſia-cloth, broad, the hundred ells, containing five ſcore, pay on importation 2 l. 3 s. $5\frac{67\frac{1}{2}}{100}$ d. and draw back on exportation 1 l. 18 s.

$\frac{67\frac{1}{2}}{100}$d. Ditto, narrow, pay on importation 1l. 14s. $9\frac{34}{100}$d. and draw back on exportation 1l. 10s. $11\frac{74}{100}$d. Lawns the piece, containing thirteen ells, 1l. 1s. $10\frac{38}{100}$d. and draw back on exportation 19s. $\frac{18}{100}$d. Silesia-lawns, the piece, containing between four and eight yards, 2s. $2\frac{38}{100}$d. and draw back on exportation 1s. $11\frac{23\frac{1}{2}}{100}$d. All linen made in Germany and Poland, as narrow-silesia, narrow-westphalia, &c. plain napkining, and all other narrow cloth made in these countries, not otherwise rated, pay, upon importation, the hundred and twenty ells, 17s. $4\frac{67}{100}$d. and draw back on exportation 15s. $5\frac{87}{100}$d. And besides the above duties, all linnens, chequered, striped, printed, painted, stained, or dyed (except lawns, striped or chequered linens, being all white, silesia-neckcloths striped at the ends only, barras or packing canvas, and buckrams) pay on importation, for every 20s. value on oath, 6s. which is returned on exportation.

LINNET, *linaria*, in ornithology, a bird of the size of the goldfinch; the head is small and flatted; the eyes are small, and hazel; the beak is conic, very small, and sharp at the point; the head, neck, and back are variegated with a bright brown and white; the breast and belly are pale, but in the male, especially in the summer, there is a redness on the top of the head and all over the breast. This is a singing bird, and sometimes has young ones four times a year, especially if they are taken from the dam before they are able to fly, which may be done four days after they are hatched. See plate CLIX. fig. 1. which represents the cock and hen, with an egg.

LINSEED, the seed of the plant linum. Linseed bruised and steeped in water, gives it very soon a thick mucilaginous nature, and communicates much of its mollient virtues to it. It is anodyne, attemperating, and of great service in suppressions of urine from inflammation and heat; it invelops the acid salts of the urine, and prevents their vellicating and wounding the tender parts; and in some measure supplies the mucus of the bladder, when abraded and worn off. It is to be given in decoction or infusion, on these occasions: the infusion is not to be made too thick or mucilaginous; because in that case it loads the stomach and breeds flatulencies in the intestines. A slight infusion of linseed, by way of tea, is recommended by many as an excellent pectoral; and the seed is a common and very good ingredient in clysters. Externally, this seed, ground to powder, is an excellent emollient; as is also the strong mucilage, made by boiling the seeds a long time: the oil drawn from it by expression, is of great service in coughs, pleurisies, and many other cases.

LINSPINS, in the military art, small pins of iron, which keep the wheel of a cannon, or waggon, on the axletree; for when the end of the axletree is put thro' the nave, the linspin is put in, to keep the wheel from falling off.

LINSTOCK, in the military art, a wooden staff, about three feet long, upon one end of which is a piece of iron, which divides in two, turning from one another, having each a place to receive match, and a screw to keep it fast: the other end is pointed, and shod with iron, to stick in the ground. It is used by gunners, to fire the guns.

LINT, *linum*, from the flax of which linnen is made. See FLAX and LINNEN.

In surgery, the term lint denotes the scrapings of linnen which is used in dressing wounds, and is made up in various forms, as tents, dossils, pledgets, &c. See the articles TENT, DOSSIL, &c.

LINTEL, in architecture, a piece of timber that lies horizontally over door posts and window-jambs, as well to bear the thickness of the wall over it, as to bind the sides of the wall together.

LINTON, a market town of Cambridgeshire, situated ten miles south-east of Cambridge.

LINTS, or LINTZ, a beautiful city, capital of Upper Austria, with a strong citadel.

LINUM FLAX, in botany, a genus of the pentandria-pentagynia class of plants, the flower of which is infundibuliform, consisting of five oblong petals; its fruit is a globose capsule, divided into ten cells, in each of which is a single acuminated seed. See the articles FLAX and LINSEED.

LION, *leo*, in zoology, the strongest and fiercest of all quadrupeds: it is a species of felis, with an elongated floccose tail, and a mane on the neck; and is larger in size than the biggest mastiff: its head is large, and the breast broad, in proportion

ſion to the other parts; the legs are alſo very thick and ſtrong, and its claws of a ſurpriſing length and thickneſs: the fur of the whole body is of a tawney yellow colour. The lioneſs is, in all reſpects, like the lion, except that ſhe wants the mane; but this makes ſo great a difference in her appearance, that ſhe ſeems a creature of a different genus. See plate CLIX. fig. 2. which repreſents a lion, called Marco, in the tower of London; alſo a lioneſs, lying upon the ground.

LIONCELLES, in heraldry, a term uſed for ſeveral lions born in the ſame coat of arms.

LIP, *labium*, or *labrum*, in anatomy, the exterior fleſhy covering of the mouth. See the article MOUTH.

The lips are two in number, an upper and under. They are compoſed principally of muſcles, and are covered externally with the general integuments, and internally with the membrane of the mouth: under this membrane there is in both lips, a great number of miliary and lenticular glands. The prolabia, when the epidermis is taken off, after macerating a ſufficient time in water, are found alſo to have a multitude of nervous papillæ; and hence it is that they are ſo extremely ſenſible. Each of the lips has its peculiar frænulum; the upper one under the noſe, and the under one near the roots of the dentes inciſores: they are of the utmoſt ſervice to us in ſpeaking, eating, and drinking.

The lips may be wounded either with ſharp or blunt inſtruments, or with bullets. Wounds of the firſt ſort, whether made lengthwiſe or tranſverſe, are generally to be cured by the dry ſuture; the patient, in this caſe, moſt carefully avoid both chewing and talking; his diet, therefore, muſt be entirely ſpoon-meat. If the wound is very large, it will require the bloody, or true ſuture. In wounds made by blunt inſtruments, by falls, or by bullets, the ſhattered parts ſhould be brought to digeſtion; and the lips of the wound, after being cleaned, be brought together, either with ſticking plaſters, or by the ſuture uſed for the hare-lip.

The moſt dreadful diſorder in the lips, is the cancer, which is, as in the other parts of the body, of two kinds, *viz.* latent, and ulcerated: by a latent cancer, is here meant a hard, painful and inflammatory tumour in the lip; and the ulcerated cancer is when the tumour degenerates into a ſpreading fetid ulcer, diſcharging an acrimonious offenſive matter, which corrodes not only the lips, but every part of the face it touches. This ſpecies is generally ſeated in the lower lip, which it quickly divides, as if it were ſlit. See a more particular account of the nature and cauſes of this diſorder, under the article CANCER.

The cure of a cancer in the lips is to be performed by different methods, according to the particular condition of the diſorder: for, 1. When only a ſmall chap or fiſſure infeſts the upper part of the lip like a painful and inflammatory ulcuſcle, the cauſe of the diſorder being external from cold, or the like, it may then be proper to treat it with honey of roſes, balſam of Peru, or ſaturnine unguent with mercury, and afterwards to cover it with a plate of lead that has been rubbed with mercury; and this continued and renewed till the diſorder diſappears: in the mean time, a proper regimen and courſe of medicines ought not to be neglected. The juice of rotten apples mixed with mercurius dulcis, has alſo afforded great relief under this diſorder. But when neither theſe, nor any other medicines, are of any ſervice, and the diſorder grows worſe and worſe, the only remedy is to extirpate the cancerous part of the lip, by two or three inciſions with a ſcalpel or lancet, obſerving to remove ſome of the ſound parts, rather than leave the leaſt bit of the cancer behind; and then you may conjoin the lips of the wound by two needles, as in the hare-lip; or when, the fiſſure is but ſmall, by the ſutura nodoſa. 2. When the cancer is not yet ulcerated, but infeſts that part of the lip next the ſkin, with a very hard and painful tumour, it is the beſt way (as the application of cauſtics is generally dangerous in theſe cancers) to extirpate it by the ſcalpel, or ſciſſars: the method of amputation for thoſe that are moveable, is to make an inciſion through the ſkin with a ſcalpel, and after freeing the tubercle from its adheſions with the knife or ſciſſars, the wound is then to be healed in the uſual manner; but ſuch as are fixed and immoveable, are to be extirpated, together with part of the lip in which they were contained, treating the wound afterwards by ſuture, as in the hare-lip. But in whatever method you proceed, it will be to no purpoſe, if the patient does not obſerve a proper regimen of diet and medicines, with bleeding and purg-

Fig. 1. LINNET, Cock, Hen, and Egg.

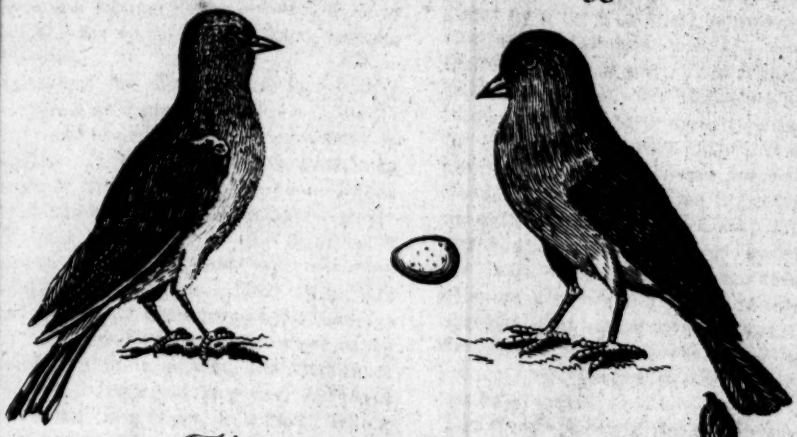
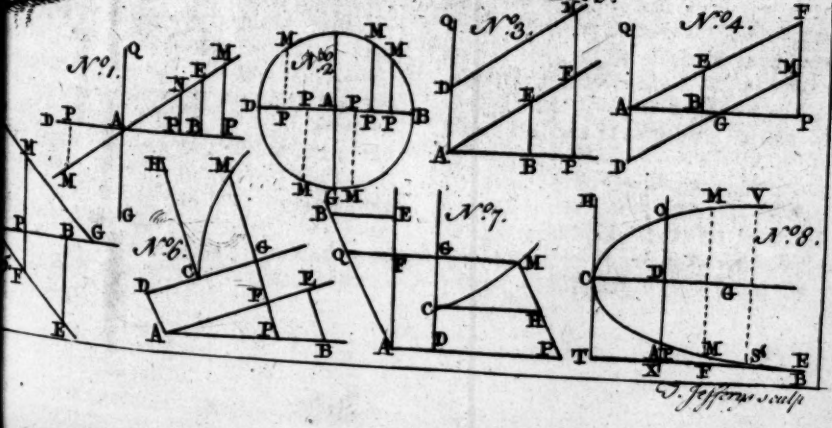


Fig. 2. The LION & LIONES.

Fig. 3. HARE-LIP.

Fig. 4 LOCUS GEOMETRICUS.



J. Jefferys sculp.

BRITISH MUSEUM

purges, to prevent a ſpeedy return of the diſorder.

Hare-LIP, a diſorder in which the upper lip is in a manner ſlit or divided, ſo as to reſemble the upper lip of a hare, whence the name.

Sometimes the diviſion is ſo large, that it appears as if part of the lip was wanting; and ſometimes again the diviſion is double. A like fiſſure is alſo ſometimes made in the lower lip by a wound that has been neglected, or improperly treated: this laſt ſpecies of the diſorder is termed the ſpurious hare-lip; the true kind is born with the infant. The leſs and more equal the fiſſure of the hare-lip is, it is generally ſo much the more eaſily cured. In ſome infants, the diviſion of the lip is ſo large and irregular, that there can be but little hopes of a cure, which may, however, be eaſily performed on the very ſame lip, when adult. Sometimes too we meet with a tooth projecting forward into the fiſſure; in this caſe it cannot be cured without firſt taking out the tooth. In a recent hare-lip, or one made by a wound, the cure is to be performed by the knotted ſuture. See the articles SUTURE and WOUND.

In curing the hare-lip, where part of the lip is wanting, no attempt can be made to ſupply what is deficient, but only to unite thoſe parts which are divided, by taking off the ſkin from the edges of the fiſſure, and then cauſing them to unite and grow together, by paſſing through them two or three needles, made of gold or ſilver, pointed with ſteel, from the right to the left, beginning with the upper part of the fiſſure, and inſerting them at about a ſtraw's breadth from each other: the ſurgeon having thus entered the needles, and cleanſed the bleeding lips with a ſponge, he takes a piece of ſtrong wax thread or ſilk, and faſtening it about one end of the needle, he winds it over the other end, and back again, as in plate CLIX. fig. 3. and afterwards ſecures it by a knot: by this means the edges of the lips are brought cloſe together, and the upper part or ſurface kept ſmooth and even. To heal the wound internally, it is dreſſed with ſoft lint dipped in honey of roſes, and put between the gums and lip; but this practice can only be followed with adults: the external part of the wound is at the ſame time dreſſed with balſam of Peru, or ſome other vulnerary unguent, covered with lint and compreſs, and over that a ſticking plaſter with four heads, two of which are faſtened on the left ſide of the lip, and two upon the right, and the whole ſecured by a ſling or fillet, whoſe extremities may be faſtened about the head, either by a knot or pins. But it muſt here be obſerved, that when the fiſſure appears large and deep, ſo that the two parts of the lip cannot be eaſily joined, it will be neceſſary, before the above operation, to divide the frænulum of the upper lip from the gum with a pair of ſciſſars, but without wounding the gum, or uncovering the jaw. Though the hæmorrhage is often very plentiful in performing theſe operations on young infants, yet it is not dangerous, ſince it prevents an inflammation, and generally ceaſes after tying the bandages.

The dreſſings ought not to be moved before the third day, unleſs ſome accident makes it neceſſary; and then it muſt be done with great caution, to avoid ſeparating the parts in contact. If the lips of the wound appear conjoined, three or four days after the operation, you may then venture to draw out the middle needle, when there are three, or the upper one, when there are only two; and two or three days after draw out the other; the cure muſt be completed by dreſſing every day, as at firſt.

LIPOTHYMIA, FAINTING, in medicine, may ariſe from ſeveral cauſes, as too violent exerciſes, ſuppreſſion of the menſes, or other accuſtomed evacuations, *&c.*

A lipothymy is often ſymptomatic, accompanying the ſcurvy, malignant fevers, and the like diſorders; which being cured, the diſpoſition to faintneſs ceaſes of courſe.

As to the cure of an idiopathic lipothymy, proceeding from the ſight of blood, wounds, ulcers, or any chirurgical operation, nothing more is neceſſary than to change the room, and go into freſh air; and if this cannot be done, the ſmell of hungary water, volatile ſpirits, wine, and ſtrong vinegar, ſprinkling the face with cold water, or a draught of generous wine, will recover the drooping ſpirits of the patient. When a perſon to be let blood is afraid of fainting, he ſhould be laid upon a bed.

In more grievous fainting fits, where gentle cordials are of little uſe, the ſtronger ſort muſt be applied, as ſpirit of ſal ammoniac, to the noſtrils, temples, and pulſes, with ſtrong frictions; or forty or

fifty drops of volatile ſpirits may be given internally, to which may be added cinnamon water, orange-flower-water, or the like; nor forgetting a draught of generous wine, with vellications and frictions of the extremities, noſe, ears, head, hair, &c. till the perſon recovers. When the patient is hyſteric, none but fetid things ſhould be applied to the noſe; ſuch are caſtor, aſa fœtida, burnt feathers, leather, horn, and the like.

If the lipothymy proceeds from exceſſive hæmorrhages, they muſt be ſtopped as ſoon as poſſible; and the patient muſt take broths, jellies, ſpirituous liquors, and generous wine, till quite recovered; which remedies are alſo to be uſed, when it proceeds from diſeaſes, loſs of ſtrength, or a defect of ſpirits and good juices.

LIPPIA, in botany, a genus of the didynamia angioſpermia claſs of plants, the flower of which is monopetalous and ringent, with a quadrifid limb; the fruit is a bivalve unilocular capſule, containing two ſeeds, which grow together.

LIQUIDAMBER, in botany, a genus of the monoecia-polyandria claſs of plants, having no corolla; the ſtamina are very numerous ſhort filaments; the calyces of the female flower are collected into a kind of globe, each conſiſting of four leaves; there is no corolla; the ſtyles are two; the fruit is compoſed of a number of oblong, bivalve unilocular capſules, formed into a globular body; the ſeeds are numerous and oblong.

This tree, which grows to a vaſt ſize, is a native of America, where a very fragrant reſin is obtained from it in great abundance, called liquidamber, which heats and moiſtens, reſolves and opens obſtructions, and is an emollient and ripener. Its principal uſe is in obſtructions and hardneſſes of the womb, in hard tumours, &c.

LIQUOR. See DRINK, FLUID, &c.

Medicated liquors are directed by Boerhaave, to be made thus: take a dram of any elæoſaccharum, and two drams of the medicated ſalt of Tachenius; grind them together in a glaſs mortar, till they become thoroughly mixed: then add ſix ounces of the cohobated diſtilled water of the ſame plant from whence the elæoſaccharum was made: and thus, in a ſmall compaſs, the virtue of a plant may be collected together for medicinal uſe, and according to its own nature in the body.

The doſe of theſe medicated liquors is principally determined from the power of the oil employed in them; the time for giving them, is chiefly when the ſtomach is empty, and according to the nature of the diſtemper; for example, a tertian fever, very cold in the beginning, is to be cured after this manner.

LIQUOR MINERALIS ANODYNUS, is a name given by Hoffman to a liquor of his invention, famous at this time in Germany, and ſuppoſed by Burggrave to be made in this manner: take oil of vitriol, and indian nitre, of each four ounces: diſtil the ſpirit gradually from this, by a retort: pour two ounces of the ſpirit cautiouſly and ſucceſſively, into fifteen ounces of ſpirit of wine, highly rectified; diſtil this, and there comes over a very fragrant ſpirit: this is to be again diſtilled, to render it perfectly pure, adding firſt to it a ſmall quantity of oil of cloves, and a quantity of water, equal to that of the ſpirit; after this, as ſoon as the watery vapours begin to riſe, the whole proceſs is to be ſtopped, and the ſpirit kept alone in a bottle, well corked. This has great virtues as an anodyne, diaphoretic, antiſeptic, and carminative. It is not certain that this is the ſame with Hoffman's, that author never having publiſhed his manner of making it; but it appears the ſame to the ſmell and taſte, and has the ſame virtues.

LIQUORICE, in the materia medica, the root of a plant called by botaniſts glycyrrhiza. See GLYCYRRHIZA.

It is an excellent medicine in coughs, and all diſorders of the breaſt and lungs; it obtunds the ſharpneſs of acrid and ſalt humours; and is alſo recommended againſt diſorders of the kidneys and bladder. It is an ingredient in almoſt all decoctions and ptiſans, in which it is eſteemed for obtunding the acrimony, and drowning the worſe flavour of the other ingredients: and it is alſo uſed in most ſyrups and electuaries. The only ſimple preparations of it in uſe, is its inſpiſſated juice, commonly known by the name of ſpaniſh juice of liquorice, as being brought originally from Spain; this hath the ſame virtues as the root itſelf. It is to be choſen firm, but not tough, hard, and when broken, of a fine, ſhining ſurface, ſuch as melts in the mouth without leaving any harſh or gritty particles in the teeth, and does not taſte of burning. It is made in the ſame manner as the other extracts. See the article EXTRACT.

LIRIODENDRUM, the TULIP-TREE, in botany, a genus of the polyandria-polyg

nia claſs of plants, the flower of which conſiſts of ſix or nine petals, which are oblong, erect, obtuſe, narroweſt at the baſe, and equal: there is no pericarpium, the ſeeds being cloſely arranged together in an imbricated manner; they are numerous, and terminate in a ſquama of a lanceolated form.

LIS, a river which riſes at Liſburg in Artois, and paſſing through part of the Netherlands, unites its waters with the Scheld at Ghent.

LISBON, the capital of Portugal, ſituated on the north bank of the Tagus, about ten miles from its mouth, and eighty miles weſt of the frontiers of Spain: weſt long. 9°, 25′, north lat. 38° 25′. It is about ſix miles long, winding with the river, from whence it riſes with an eaſy aſcent, and is computed to contain about 30,000 houſes, 200,000 inhabitants, forty pariſh churches, and forty convents of both ſexes.

LISIEUX, a large city and biſhop's ſee of France, in the province of Normandy: eaſt longitude 16′, and north latitude 40° 14′.

LISLE, or RYSSEL, a large and populous city, the capital of French Flanders, ſituated on the river Deule, twelve miles weſt of Tournay: eaſt long. 3°, and north lat. 50° 42′.

LIST, in commerce, the bordure of cloth, or of a ſtuff; ſerving not only to ſhew their quality, but to preſerve them from being torn in the operations of fulling, dying, &c.

Liſt is uſed on various occaſions; but chiefly by gardeners, for ſecuring their wall-trees.

LIST, in architecture, a little ſquare moulding, otherwiſe called a fillet, liſtel, &c. See FILLET and MOULDING.

LITANY, a ſolemn form of ſupplication to God, in which the prieſt utters ſome things fit to be prayed for, and the people join in their interceſſion, ſaying, *we beſeech thee to hear us, good Lord*, &c.

At firſt, the uſe of litanies was not fixed to any ſtated time, but were only employed as exigencies required. They were obſerved, in imitation of the Ninevites, with ardent ſupplications and faſtings, to avert the threatning judgments of fire, earthquakes, inundations, or hoſtile invaſions. About the year 400, litanies began to be uſed in proceſſions, the people walking barefoot, and repeating them with great devotion; and it is pretended, that by this means, ſeveral countries were delivered from great calamities. The days on which theſe were uſed, were called rogation days: theſe were appointed by the canons of different councils, till it was decreed by the council of Toledo, that they ſhould be uſed every month throughout the year; and thus by degrees they came to be uſed weekly on Wedneſdays and Fridays, the antient ſtationary days for faſting. To theſe days the rubric of our church has added Sundays, as being the greateſt days for aſſembling at divine ſervice. Before the laſt review of the Common Prayer, the litany was a diſtinct ſervice by itſelf, and uſed ſometime after the morning prayer was over; at preſent it is made one office with the morning ſervice, being ordered to be read after the third collect for grace, inſtead of the interceſſional prayers in the daily ſervice.

LITCHFIELD, a city of Staffordſhire, one hundred miles north weſt of London, and twelve ſouth-eaſt of Stafford. This city and Coventry have one biſhop between them: it ſends two members to parliament.

LITERATI, in general, denotes men of learning; but is more particularly uſed by the Chineſe, for ſuch perſons as are able to read and write their language. See the article CHINESE.

LITHANTHRAX, PIT-COAL, in natural-hiſtory, a genus of foſſils, defined to be ſolid, dry, opake, inflammable ſubſtances, found in large ſtrata, ſplitting horizontally more eaſily than in any other direction, of a gloſſy hue, ſoft and friable, not fuſible, but eaſily inflammable, and leaving a large reſiduum of aſhes.

Of this genus there are three ſpecies, 1. The hard, duſky, black coal, known in London by the name of ſcotch coal. 2. The hard, gloſſy, black coal, known by the ſame name; though both theſe ſpecies are found alſo in England, particularly about Limington and in Wales. 3. The friable, gloſſy, black coal, called Newcaſtle coal, as being chiefly dug about that town.

LITHARGE, is properly a recrement of lead, or lead vitrified, either alone, or with a mixture of copper. It is of two kinds, differing in colour, though in no other quality; the one of theſe is called litharge of gold, and the other litharge of ſilver: theſe are collected from the furnaces where ſilver is ſeparated from lead, or from thoſe where gold and ſilver are purified by means of that metal; but

the litharge ſold in the ſhops is produced in the copper-works, in which lead is uſed either to purify the metal, or to ſeparate the ſilver from it: this is of a redder or yellower colour, as the fire has been more or leſs ſtrong, and is always compoſed of a multitude of thin flakes. Litharge is ſoluble in oil, and all other unctuous ſubſtances; and thus diſſolved, it makes the baſis of a great part of the ointments and plaſters of the ſhops. It is drying, abſtergent, and ſlightly aſtrictive, and hence it is of great uſe in cleanſing ulcers, and diſpoſing them to incarnate.

LITHIDIA, in natural hiſtory, the name of a large claſs of foſſils, including the flint and pebble kinds. See the articles FLINT and PEBBLE.

The lithidia are defined to be ſtones of a debaſed cryſtalline matter, covered by, and ſurrounded with, an opake cruſt, and frequently of great beauty, and conſiderable brightneſs within, tho' of but a ſlight degree of tranſparency, approaching to the nature of the ſemi-pellucid gems, and like them found in not very large maſſes. See the article GEM.

The bodies of this claſs are divided into two general orders, and under thoſe into three genera. The firſt order of the lithidia contains thoſe compoſed of a cryſtalline matter, but ſlightly debaſed, and that ever by one and the ſame earth, tho' diffuſed thro' them in different degrees, and always free from veins. The ſecond order is of thoſe of a more debaſed cryſtalline matter, blended with different portions of different coloured earths. Of the firſt of theſe orders there is only one genus, which is that of the common flint. Of the ſecond order there are two genera. 1. The homochroa, which are of one plain and ſimple colour; and, 2. The calculi, which are compoſed of cruſts of ſeveral different colours. Both theſe genera are compriſed under the common Engliſh name of pebbles.

LITHOCOLLA, a cæment uſed by lapidaries for faſtening precious ſtones together. See the article CÆMENT.

LITHOGENESIA, a term uſed by ſome authors, for the formation of ſtones. See the article STONE.

Henkel has thrown together ſome very ingenious thoughts on this abſtruſe ſubject, in a treatiſe publiſhed in the year 1734, where he builds no opinion on any other baſis than that of facts, obſervations of nature, and experiments. He ſuppoſes that the earth was at firſt every where ſoft on the ſurface, and that this ſoft matter, by degrees, hardened, and formed ſtones of ſeveral kinds. He ſeems to imagine, that the ſurface of the earth was a ſecond time all reduced to this ſoft ſtate by the univerſal deluge at the time of Noah, and that this matter, afterwards hardening into ſtones of various kinds, included the ſhells of ſea-fiſhes and other animal-remains of the produce of the ſeas, in flints, in lime-ſtone, or in whatever other ſubſtance the matter among which they lay chanced to harden. Thus may the ſea ſhells, found ſingly in the middle of hard flints, or lodged in vaſt numbers in the ſtrata of earth, limeſtone, or marble, be accounted for. Waters of other kinds we are very ſenſible may carry particles of ſtony matter, and lodge them ſo in other bodies, as to form complete, hard and ſolid ſtones: this is frequently done at this day in the common petrifactions of wood, and in the ſtones generated in the bladders of animals. If this be allowed a property common to ſeveral fluids, nay to water in ſeveral ſtates, there is no reaſon why it ſhould be denied to have exiſted in that of the univerſal deluge; and if that be acknowledged to have had a power of forming ſtones of various kinds, there is no wonder that ſtones of various kinds ſhould be found in the ſtrata, and on the ſurface of this earth which was all covered by that water; or that the ſtones formed in that immenſe body of water ſhould ſhew, as they do in many inſtances, the ſeveral cruſts or coats laid one upon another, by the ſucceſſive applications of the matter of which they were formed. If we conſider alſo the immenſe quantity of animal and vegetable-bodies; ſome entire, others only ſeparated into parts, which muſt have been mixed with, floating among, or lying upon the bottom of this immenſe body of water; and that ſtones were continually forming out of this water at the time; we cannot wonder that theſe ſtones ſhould take up theſe parts of plants or animals, or concrete about them, or that we ſhould find ſhells and teeth of fiſhes or pieces of wood, or leaves of plants preſerved in them. Nor is water alſo the agent that may have made the changes in the once ſoft parts of the earth's ſurface; we can by fire reduce the pooreſt earths into a ſort of glaſs, a hard tranſparent body, not a little reſembling the nature of flint or the

ſemi-pellucid ſtones. Fire has a power to do great things in the bowels of the earth, and the way to learn what changes it may there make in ſtones, is to try its effects upon the ſeveral different kinds of ſtones and earths here. By experiments of this kind we learn, that of the ſeveral ſpecies of ſtones in their preſent ſtate, ſome are reduced to a friable maſs, and finally to powder, by the force of fire, others are hardened by it, others are melted, and become a kind of glaſs: and by experiments, on the other foſſile-ſubſtances, it appears, that the original matter of all ſtones has been earth, either of the nature of chalk, marle, or clay; and that many of them have been greatly altered by receiving metallic or other mineral matter into their earthy matter, at the time of their formation; and all ſeem to have owed their change into their hard ſtate, either to fire alone, or to ſaline oily, metallic, or ſaline ſulphureous matters, either conjunctly with the force of this agent, or alone.

Thoſe ſtones, which were formed in their preſent ſtate, immediately out of fluids, have been produced either by congelation, a rude coalition, or cryſtalization; and that all the gems have been once fluid, is plain from their imperfections in certain inſtances, as from their containing grains of ſand, or the like extraneous ſubſtances, firmly embodied in them. If theſe, the hardeſt of all ſtones, have been once fluid, there is no reaſon to diſpute, but that all the other kinds may have been ſo, which are leſs hard and leſs perfect.

LITHOMANTIA, Λιθομαντεια, in antiquity, a ſpecies of divination performed with ſtones. Sometimes the ſtone, called ſiderites, was uſed: this they waſhed in ſpring-water, in the night, by candle-light; the perſon that conſulted it was to be purified from all manner of pollution, and to have his face covered: this done, he repeated divers prayers, and placed certain characters in an appointed order; and then the ſtone moved of itſelf, and in a ſoft, gentle, murmur, (or as ſome ſay) in a voice like that of a child, returned an anſwer. By a ſtone of this nature, Helena is reported to have foretold the deſtruction of Troy.

LITHOMARGA, *Stone marle*, a name given by ſome authors to a ſparry ſubſtance highly debaſed by earth, which is found in great plenty in the caves of the Hart's foreſt in Germany, and uſed there in medicine, under the name of the unicornu foſſile, or foſſile unicorn's horn, from its ſometimes emulating that figure. See the articles MARLE and UNICORNU.

LITHONTRIPTICS, medicines which either break or are ſuppoſed to have the virtue of breaking ſtones in the urinary paſſages. Of this kind is Mrs. Stephen's medicine, which is a compoſition of ſoap and lime made of different ſhells, which every body knows to be highly cauſtic, and is therefore condemned by Dr. Mead; ſince its corroſive quality muſt be injurious to the bladder: however, under proper management, he thinks it may be of ſome ſervice in expelling gravel by the urinary paſſages; tho' it will never be able to break calculi of the hardneſs of ſtone. Dr. Whytt, of Edinburgh, after conſidering the inconveniencies and ſometimes miſchiefs of this celebrated ſpecific, reſolved to omit the ſoap, and try what virtues lime-water would have without it, in diſſolving the calculus; and found that lime-water made by pouring ſeven or eight pints of water on one pound of freſh calcined oyſter or cockle-ſhells, poſſeſſed a greater power of diſſolving the calculus, than that of ſtone-lime; and by giving four pints of it a day to adults, and to children in proportion, he found that it produced the moſt happy effects.

LITHOPHYTA, in botany, a ſubdiviſion of the cryptogamia claſs of plants, ſo called from their approaching to a ſtony hardneſs, comprehending the iſis, ſpongia, millepora, tubipora, &c.

LITHOSPERMUM, GROMWELL, in botany, a genus of the pentandria-monogynia claſs of plants, the corolla of which conſiſts of a ſingle petal of the length of the cup: the tube is cylindric, the limb ſemiquinquifid, obtuſe and erect: there is no pericarpium, but the cup becomes patulous and long, containing four broad, oval, acuminated and hard ſeeds.

The ſeeds of this plant, being the only parts uſed in medicine, are accounted diuretic. Emulſions are made of them with dog's graſs-water.

LITHOSTROTION, in natural hiſtory, the name of a ſpecies of foſſile-coral, compoſed of a great number of long and ſlender columns, ſometimes round, ſometimes angular, jointed nicely to one another, and of a ſtarry or radiated ſurface at their tops. Theſe are found in conſiderable quantities in the northern and weſtern

weſtern parts of this kingdom, ſometimes in ſingle, ſometimes in complex ſpecimens. See the article CORAL.

LITHOTOMY, in ſurgery, cutting for the ſtone. See the article STONE.

Mr. Sharp lays down the following method of ſearching for the ſtone. The patient being laid on an horizontal table with his thighs elevated, and a little extended, paſs the ſound, or catheter, with the concave part towards you, till it meets with ſome reſiſtance in the perinæum a little above the anus; then turning it without much force, puſh it gently on into the bladder, and if it meets with an obſtruction at the neck, raiſe its extremity upwards, by inclining the handle of it towards you; and if it does not then ſlip in, withdraw it a quarter of an inch, and introducing your fore-finger into the rectum, lift it up, and it will ſeldom fail to enter. Though, upon ſearching, the ſurgeon may be aſſured of a ſtone in the bladder, yet he is not without farther inquiry to operate immediately; ſince there are ſome obſtacles that forbid the operation, either abſolutely, or only for a certain time. Among theſe, that of the greateſt conſequence is the gravel or ſtone in the kidneys, which is known by the pain in the loins, vomiting, retraction of the teſticles, numbneſs of the thighs, and often by matter which the inflammation produces in the kidneys. Difference of age make an extreme difference in danger, infants and young people almoſt always recovering; but ſtill the operation is adviſeable in thoſe advanced in years, though it is not attended with near the ſame ſucceſs. Before the operation is performed, it is proper to prepare the patient with a gentle purge the preceding day, and a clyſter early in the morning, which will be of great ſervice in cooling the body and making the operation leſs dangerous, where the rectum is liable to be wounded when full.

The moſt convenient time for the operation of lithotomy is ſpring or autumn, though when the patient is in exquiſite torment, or his life in danger, the preſent opportunity ſhould be embraced.

Lithotomy is of two kinds: that made into the bladder is termed cyſtotomy; but when the ſtone is in the kidneys, which very rarely happens, the operation is termed nephrotomy.

With reſpect to the ſeveral methods of performing lithotomy for the ſtone in the bladder, they, according to Heiſter, are four: the firſt, and moſt antient, is the apparatus minor, called likewiſe the celſian or guidonian method: the ſecond the apparatus magnus, or Marianus's method; the latter being termed the new, and the former the old method: the third is the apparatus altus, or hypogaſtic ſection; wherein the inciſion is made at the lower part of the abdomen in the anterior ſide of the bladder, immediately above the os pubis; whereas in the reſt it is made in the perinæum, between the anus and the ſcrotum: the fourth, and moſt modern method, was invented toward the end of the laſt century, and is termed the lateral operation.

1. The firſt method is now entirely laid aſide, though Heiſter thinks it practicable on boys under fourteen: the wound of the bladder in this operation, ſays Sharp, is made in the ſame place as is now practiſed in the lateral method; but its being impracticable on ſome ſubjects, and uncertain in all others, has made it to be univerſally exploded.

2. In performing lithotomy by the apparatus major, Mr. Sharp's directions for the ſituation of the patient are thus: Having laid the patient on a ſquare horizontal table, three feet four inches high, with a pillow under his head, let his legs and thighs be bent, and his heels made to approach his buttocks by tying his hands to the ſoles of his feet with a couple of ſtrong ligatures; and to ſecure him more effectually from ſtruggling, paſs a double ligature under one of his hams, and carry the four ſtrings round his neck to the other ham: then paſs the loop underneath, make a knot by threading one of the ſingle ends through the loop; and thus the thighs are to be widened from each other, and firmly ſupported by proper perſons.

The patient thus ſituated, Heiſter directs the operation as follows: the operator dipping the beak of a ſizeable and crooked ſteel catheter A (plate CLX. fig. 1.) in oil, he conveys it thro' the urethra into the bladder, and being aſſured there is a ſtone, turns the crooked part of the catheter from the bladder and urethra towards the right ſide of the perinæum, but the handle of the penis which contains it, towards the right inguen, then delivers it to the aſſiſtant who holds up the ſcrotum in the other hand; for the crooked convex part of the catheter thus elevated in the perinæum

BRITISH MUSEUM

weſtern parts of this kingdom, ſometimes in ſingle, ſometimes in complex ſpecimens. See the article CORAL.

LITHOTOMY, in ſurgery, cutting for the ſtone. See the article STONE.

Mr. Sharp lays down the following method of ſearching for the ſtone. The patient being laid on an horizontal table with his thighs elevated, and a little extended, paſs the ſound, or catheter, with the concave part towards you, till it meets with ſome reſiſtance in the perinæum a little above the anus; then turning it without much force, puſh it gently on into the bladder, and if it meets with an obſtruction at the neck, raiſe its extremity upwards, by inclining the handle of it towards you; and if it does not then ſlip in, withdraw it a quarter of an inch, and introducing your fore-finger into the rectum, lift it up, and it will ſeldom fail to enter. Though, upon ſearching, the ſurgeon may be aſſured of a ſtone in the bladder, yet he is not without farther inquiry to operate immediately; ſince there are ſome obſtacles that forbid the operation, either abſolutely, or only for a certain time. Among theſe, that of the greateſt conſequence is the gravel or ſtone in the kidneys, which is known by the pain in the loins, vomiting, retraction of the teſticles, numbneſs of the thighs, and often by matter which the inflammation produces in the kidneys. Difference of age make an extreme difference in danger, infants and young people almoſt always recovering; but ſtill the operation is adviſeable in thoſe advanced in years, though it is not attended with near the ſame ſucceſs. Before the operation is performed, it is proper to prepare the patient with a gentle purge the preceding day, and a clyſter early in the morning, which will be of great ſervice in cooling the body and making the operation leſs dangerous, where the rectum is liable to be wounded when full.

The moſt convenient time for the operation of lithotomy is ſpring or autumn, though when the patient is in exquiſite torment, or his life in danger, the preſent opportunity ſhould be embraced.

Lithotomy is of two kinds: that made into the bladder is termed cyſotomy; but when the ſtone is in the kidneys, which very rarely happens, the operation is termed nephrotomy.

With reſpect to the ſeveral methods of performing lithotomy for the ſtone in the bladder, they, according to Heiſter, are four: the firſt, and moſt antient, is the apparatus minor, called likewiſe the celſian or guidonian method: the ſecond the apparatus magnus, or Marianus's method; the latter being termed the new, and the former the old method: the third is the apparatus altus, or hypograſtic ſection; wherein the inciſion is made at the lower part of the abdomen in the anterior ſide of the bladder, immediately above the os pubis; whereas in the reſt it is made in the perinæum, between the anus and the ſcrotum: the fourth, and moſt modern method, was invented toward the end of the laſt century, and is termed the lateral operation.

1. The firſt method is now entirely laid aſide, though Heiſter thinks it practicable on boys under fourteen: the wound of the bladder in this operation, ſays Sharp, is made in the ſame place as is now practiſed in the lateral method; but its being impracticable on ſome ſubjects, and uncertain in all others, has made it to be univerſally exploded.

2. In performing lithotomy by the apparatus major, Mr. Sharp's directions for the ſituation of the patient are thus. Having laid the patient on a ſquare horizontal table, three feet four inches high, with a pillow under his head, let his legs and thighs be bent, and his heels made to approach his buttocks by tying his hands to the ſoles of his feet with a couple of ſtrong ligatures; and to ſecure him more effectually from ſtruggling, paſs a double ligature under one of his hams, and carry the four ſtrings round his neck to the other ham: then paſſing the loop underneath, make a knot by threading one of the ſingle ends through the loop; and thus the thighs are to be widened from each other, and firmly ſupported by proper perſons.

The patient thus ſituated, Heiſter directs the operation as follows: the operator dipping the beak of a ſizeable and grooved ſteel catheter A (plate CLX. fig. 1.) in oil, he conveys it thro' the urethra into the bladder, and being aſſured there is a ſtone, turns the crooked part of the catheter in the bladder and urethra towards the left ſide of the perinæum, but the handle and penis which contains it, towards the right inguen, then delivers it to the aſſiſtant who holds up the ſcrotum in the other hand; for the crooked convex part of the catheter thus elevated in the perinæum renders

BRITISH MUSEUM

Fig. 1. Instruments used in LITHOTOMY.

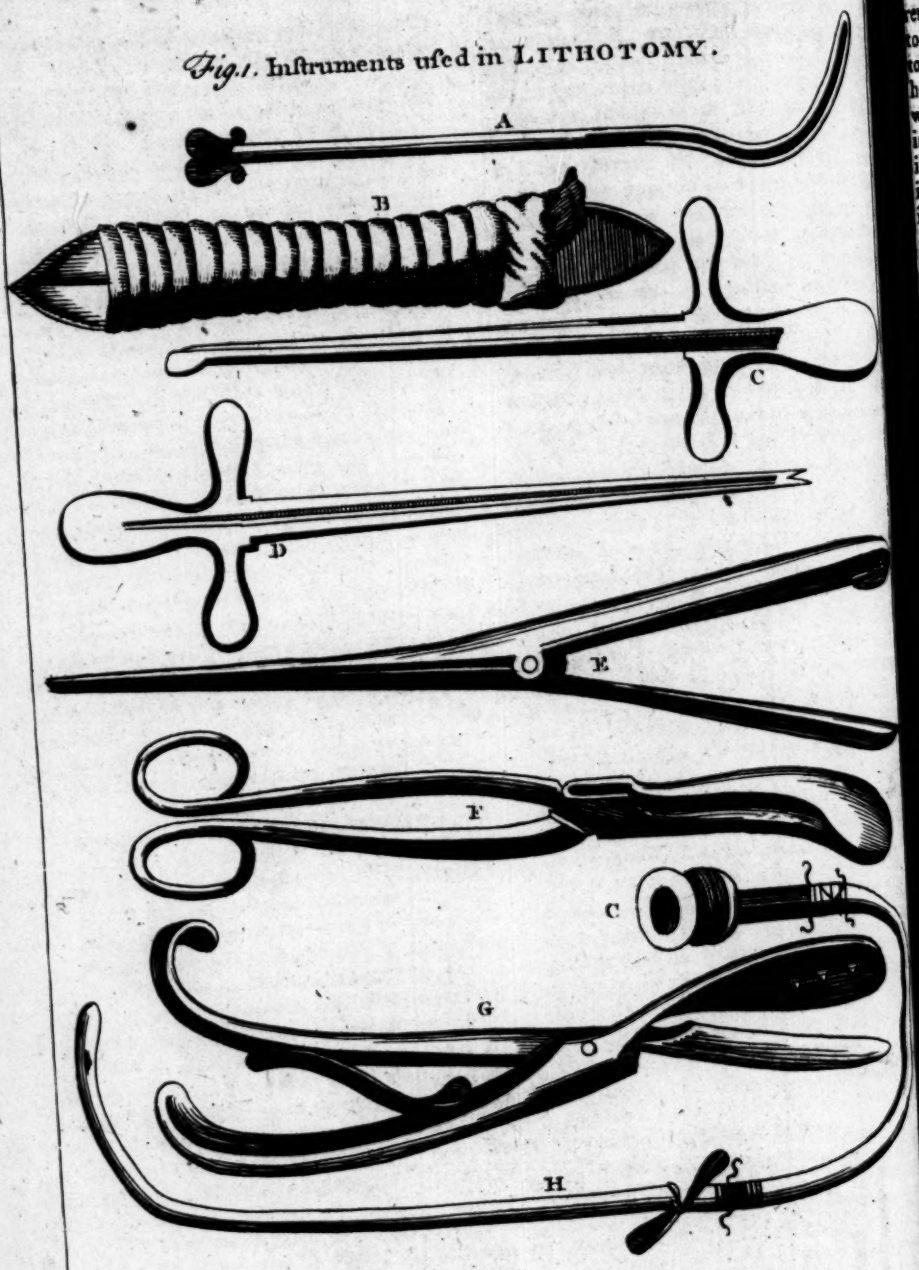
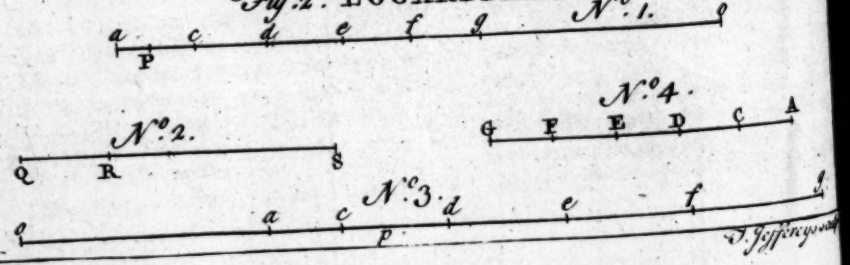


Fig. 2. LOGARITHMS.



renders that part of the urethra which is to be divided, ſufficiently perceptible both to the ſight and touch. He next lays hold of the integuments of the perinæum with the fingers of his left hand, holding in his right the inciſion-knife, B, wrapped in linen, as he would do a pen for writing: with this he makes a longitudinal inciſion downwards, about the middle of the left ſide of the perinæum near the future, through the fat; then he again feels for the catheter, and afterwards divides the urethra in a direct line downward, ſo that the end of the knife may paſs into the groove of the catheter. After a proper inciſion, the ſurgeon parts with his knife, inſerting in the groove of the catheter, if an aſſiſtant holds it, the nail of his finger or thumb: then he takes a male conductor, C, dips it in warm oil, and having paſſed it thro' the groove of the catheter and neck of the bladder into the bladder itſelf, extracts the catheter. The male conductor being thus paſſed, a female conductor, D, is introduced upon it, in ſuch a manner as the latter receives the prominent back of the former in its groove, and conveys it ſafely into the bladder thro' its neck. After this the two conductors are gently ſeparated by their handles, and then a ſtraight forcep, E, dipt in oil and ſhut very cloſe, is carefully conveyed into the bladder between the conductors. The forceps, after it is introduced, and the conductors withdrawn, muſt be opened ſeveral times to dilate the wound, and then ſhut to ſearch for the ſtone: when the ſtone is found, they muſt be opened with both hands, in ſuch a manner that one jaw, if poſſible, may lay hold under the ſtone, and the other above it. When the ſtone is thus intercepted, the forceps, by a gentle motion from ſide to ſide, muſt be brought towards the rectum, and the ſtone extracted downwards, becauſe the parts dilate and yield more eaſily that way, while upwards they meet with a reſiſtance from the os pubis: but if it lies concealed in any part of the bladder, and cannot be laid hold of by the forceps, the operator muſt paſs the two firſt fingers of his hand in the anus, elevate the ſtone, and force it into them. If it is ſituated in the upper part of the bladder, behind the oſſa pubis, the inferior part of the abdomen muſt be preſſed downwards by the hand, that it may commodiouſly be taken hold of, and drawn out by the ſtraight or a crooked forceps; and if it is lodged on either ſide, the crooked inſtrument F is moſt convenient.

When the ſtone is too large to be extracted whole, it muſt be broken by a forceps, G, with teeth, and the fragments to be drawn out one after another. Laſtly, if the ſtone is too large and too hard to be either extracted or broken, a prudent ſurgeon will deſiſt, and heal the wound or leave a fiſtula for the diſcharge of the urine. The ſtone being thus extracted, and the bladder cleared, the wound is cleanſed with a ſponge, the ligatures unty'd, the patient put to bed, and the wound now dreſſed with doſſils of ſcraped lint: if the hæmorrhage be too profuſe, it may be ſtopped by pledgets of lint dipt in a proper ſtyptic, and the arteries compreſſed with the fingers till it ſtops. Theſe muſt be covered with a linen bolſter, and a large ſquare compreſs without a plaſter, ſecuring the whole with the T bandage, or that with four heads; and if they are ineffectual, the artery muſt be tied up with a crooked needle and thread. See HÆMORRHAGE.

After dreſſing, the patient muſt be ſupplied with plenty of ptiſan, barley-water, or a ſtrengthening and compoſing emulſion; his diet ſhould be the ſame as for people in fevers, or after great wounds. See the articles FEVER and WOUND.

3. The apparatus altus, or high operation, is performed as follows. The patient being duly prepared, and laid in a proper ſituation, a hollow ſilver-catheter, with a flexible leathern tube H *(ibid.)* at the end of it is to be introduced into the bladder: to the tube muſt be fitted a large ſyringe, for the injecting of ſuch warm water, barley-water, or milk, as the patient can bear. When this is done, the catheter is extracted: then while an aſſiſtant introduces his two fore-fingers into the anus to elevate the ſtone and bladder, the operator makes an inciſion in a right line through the ſkin, fat, and abdominal muſcles, immediately above the oſſa pubis. The external wound ſhould be three fingers-breadth long in children, and four in adults; then introducing the left index, the ſurgeon feels for the liquor that diſtends the bladder, and then makes an inciſion into the bladder immediately above the juncture of the oſſa pubis: after which he paſſes a ſmall knife into the body of the bladder, ſo as to make a ſmall wound with the point only; through this aperture he paſſes a crooked or ſtraight knife, armed with

with a button, whereby he enlarges the wound upwards the breadth of one or two fingers. He then introduces his left index to draw the upper part of the bladder towards the navel, and then enlarges the wound downwards. Immediately after, he introduces the fore-finger of the other hand, and examines the ſize and ſituation of the ſtone, and accordingly he enlarges the wound either upwards or downwards, in order to extract it. And when the ſtone is extracted, and nothing left, the wound is dreſſed, and the patient treated much in the ſame manner as in the former caſe.

4. The fourth method, which is called the lateral operation, is performed by Cheſelden thus: every thing being properly prepared, he introduces a catheter, and afterwards makes an inciſion of a proper length, beginning where they end in the apparatus major, and continuing it downwards between the accelerator urinæ, and erector penis, on the left ſide of inteſtinum rectum; and directing his knife to the poſterior part of the catheter, through the inferior and lateral part of the bladder, behind the proſtate gland, and above the ſeminal veſicles, he then continues it forwards through the ſphincter of the bladder, and left ſide of the proſtrate glands into the membranous part of the urethra even to its bulb, which preſerves the rectum better than the lateral method.

Among Cheſelden's emendations, Douglas enumerates theſe. 1. If he finds the patient's pulſe low after the operation, he applies bliſters to the arms, which effectually raiſe his ſpirits. 2. If the wound grows callous, he lays on a piece of bliſter-plaſter to erode it, by which new fleſh pullulates, and the wound unites. 3. If the wound be putrid, he mixes a little verdigreaſe with ſome digeſtive ointment.

Women are leſs ſubject to the ſtone in the bladder than men, and their urinary paſſages are more ſhort and lax, ſo that in general the ſtone being but ſmall, diſcharges itſelf with the urine, and when it happens to increaſe in the bladder, we have inſtances of its coming away ſpontaneouſly. Douglas propoſes to extract a ſmall ſtone in a woman, by dilating the urethra with a tent of gentian-root, or prepared ſponge; but when the ſtone is large, he approves of the high operation, diſtending the bladder with warm water, and compreſſing the urethra by an aſſiſtant's finger in the vagina, and then making an inciſion into the bladder immediately above the os pubis. This, Heiſter ſays, is a very proper method, when the ſtone is very large, and the patient young and healthy; but Morand, when the ſtone is ſmall, prefers the apparatus major.

Upon the whole, lithotomy appears to be a dangerous and precarious operation, nor can one method alone be depended on; but the ſurgeon muſt be determined in the choice, by the particular circumſtances of the caſe.

Nephrotomy, the ſecond ſpecies of lithotomy, is by moſt writers on the ſubject thought impracticable, who therefore abſolutely reject it; tho' we have many inſtances of perſons, who have been cured of wounds of the back penetrating to the kidneys. Heiſter mentions one cure of this kind performed by himſelf. Wounds, therefore, of the kidneys, eſpecially thoſe inflicted on the back, without penetrating into the cavity of the abdomen, he ſays, are often curable. And though Hippocrates prohibits his pupils from practiſing lithotomy, yet in treating of diſorders in the kidneys, in his work De Intern. Affect. he directs to make an inciſion near the kidneys when it is tumified and elevated, and after extracting the pus, to diſcharge the gravel by diuretics; for this opening may preſerve the patient, who muſt otherwiſe die: and again, he ſays, when the kidney, being ſuppurated, tumifies near the ſpine, a deep inciſion ſhould be made upon the tumour near the kidney, or into the kidney itſelf. Hence it is manifeſt, that a wound in theſe parts did not appear ſo formidable to him. Rouſet, Riolanus and others, think nephrotomy may be practiſed with ſucceſs, if the opening be made where the ſtone is perceptible, and neither the emulgent artery, vein, nor ureter wounded, nor the cavity of the abdomen penetrated. But beyond all diſpute it muſt be reaſonable, when nature points out the place by a tumour or abſceſs in the loins, proceeding from a ſtone in the kidneys.

LITHOXYLUM, in botany, a term uſed by Linnæus, to expreſs a heterogeneous ſubſtance on ſea-plants, which has ſuch reſſifications in impreſſed points.

LITHOZUGIA, in natural hiſtory, a genus of foſſils, of the claſs of the ſcruples compoſed of a ſimply ſtony matter, [illegible]

ing a kind of cement, and holding firmly together ſmall pebbles, &c. embodied in it. See the article SCRUPI.

There are two kinds of the lithozugia. 1. That of a cryſtalline baſis and purer texture, approaching to the nature of flint, called by the engliſh lapidaries the pudding-ſtone: of this kind are reckoned four ſpecies; the yellowiſh white lithozugium, the greyiſh white lithozugium, the red lithozugium, and the brownish lithozugium, all filled with pebbles. 2. The lithozugia of a coarſer texture, approaching to the nature of quarry-ſtone: of this kind there are alſo reckoned four ſpecies, *viz.* the freſh-coloured lithozugium, filled with reddiſh, impure, cryſtalline nodules; the bluiſh, glittering lithozugium, filled with white, impure, cryſtalline nodules; the whitiſh, green, elegant lithozugium, filled with cryſtalline nodules; and the friable, pale, red lithozugium, variegated with white veins and red nodules.

LITHUANIA, a province of Poland, bounded by Samogitia, Livonia, and part of Ruſſia, on the north; by another part of Ruſſia, on the eaſt; by Volhinia and Poleſia, on the ſouth; and by Pruſſia and Polachia on the weſt.

LITURGY, λειτουργια, a name given to thoſe ſet forms of prayer which have been generally uſed in the chriſtian church. Of theſe there are not a few aſcribed to the apoſtles and fathers, but they are almoſt univerſally allowed to be ſpurious.

The modern liturgies are diverſified according to the diverſity of nations profeſſing the chriſtian religion. Of theſe there are the armenian liturgy, compoſed by one of their patriarchs, named John; that of the cophti or chriſtians of Egypt, written in the cophtic or egyptian language: the æthiopian liturgy, written in the old æthiopic tongue, ſaid to be written by Dioſcorus, patriarch of Alexandria; the Greeks have four liturgies, *viz.* thoſe of St. James, St. Mark, St. John Chryſoſtom, and St. Baſil; but they ordinarily read only the latter, the liturgy of St. James being read only at Jeruſalem, and that of St. Mark only at Alexandria: the ſyriac liturgies are much more numerous than the Greek; for father Simon tells us, that the jacobites reckon up forty different liturgies, all under different names. The miſſal of the Maronites contains twelve liturgies, under the names of St. Xyſtus, pope; St. John Chryſoſtom; St. John the evangeliſt; St. Peter, the apoſtle; St. Dionyſius; St. Cyril; Matthew, the paſtor; John, patriarch; St. Euſtathius; St. Maruta; St. James, the apoſtle; St. Mark, the evangeliſt; and a ſecond of St. Peter: and the Neſtorians have three liturgies, that of the twelve apoſtles, that of Theodoſius, turnamed the interpreter, and a third under the name of St. Neſtorius.

The liturgy of the church of England was compoſed in the year 1547, ſince which time it has undergone ſeveral alterations, the laſt of which was in the year 1661, and of this liturgy Dr. Comber gives the following character. "No "church was ever bleſſed with ſo com- "prehenſive, ſo exact, and ſo inoffenſive "a liturgy as ours: which is ſo judi- "cioufly contrived, that the whole may "exerciſe at once their knowledge and "devotion; and yet ſo plain, that the "moſt ignorant may pray with under- "ſtanding; ſo full, that nothing is omit- "ted, which ought to be aſked in public; "and ſo particular, that it compriſeth "moſt things which we would aſk in "private; and yet ſo ſhort, as not to "tire any that have true devotion. Its "doctrine is pure and primitive; its "ceremonies ſo few and innocent, that "moſt of the chriſtian world agree in "them: its method is exact and natu- "ral, its language ſignificant and per- "ſpicuous, moſt of the words and phra- "ſes being taken out of the holy ſcrip- "ture, and the reſt are the expreſſions "of the firſt and pureſt ages." — And in the opinion of the moſt impartial and excellent Grotius, (who was no member of, nor had any obligation to, this church) "the engliſh liturgy comes ſo "near the primitive pattern, that none "of the reformed churches can compare "with it." Again, he ſays, "In the "prayers, a ſcholar can diſcern cloſe "logic, pleaſing rhetoric, pure divinity, "and the very marrow of the antient "doctrine and diſcipline; and yet all "made ſo familiar, that the unlearned "may ſafely ſay, Amen."

LITUUS, in roman antiquity, a ſhort ſtraight rod, only bending a little at one end, uſed by the auguris. See AUGUR. The appellation lituus is alſo given to a muſical inſtrument of the wind kind, uſed in the roman armies; probably from its reſemblance to the ſacred rod of the augurs.

LIVADIA, the capital of a province of

 eur.pean

european Turky, the antient Achaia, ſituated on the north ſide of the gulph of Lepanto: eaſt long. 23° 15′, north lat. 37° 30′.

LIVER, *hepar*, in anatomy, a very large viſcus, of a red colour, ſituated in the right hypochondrium, and ſerving for the ſecretion of the bile or gall. See the article BILE.

Its figure is irregular; the upper ſurface being convex, ſmooth, and equal; the lower, hollow, and unequal. There is alſo a remarkable eminence called the porta, juſt where the vena portæ enters it.

In the liver we are alſo to obſerve the capſule of Gliſſonius, its diſcoverer; which includes the branches of the vena portæ, and the biliary ducts, as they approach the liver, as well as within it.

The veſſels of the liver are very numerous; receiving arteries from the cœliac, cyſtics, diaphragmatics, &c. veins, from the vena portæ, vena cava, and diaphragmatic vein; and nerves from the plexus hepaticus of the intercoſtals. See the articles ARTERY, VEIN, and NERVE.

The biliary veſſels are the ductus choledocus communis, which opens obliquely into the duodenum; the ductus cyſticus, which runs from the gall-bladder to the common duct; and the ductus hepaticus, which runs from the liver to the common duct; and the branches of this diſtributed through the liver, make what are called pori biliarii. See the articles DUCT, GALL-BLADDER, &c.

The lymphatic veſſels of the liver are to be demonſtrated either by a ligature of the vena portæ in living animals, or by inflation into the artery, or hepatic duct, in dead ones. To theſe veſſels we may add the canalis venoſus, and the great ſinus of the vena portæ in the fœtus. See the article FOETUS.

The ſubſtance of the liver was, by the antients, ſuppoſed to be formed merely of blood, concreted into a firm maſs: Malpighi, and many of the later writers, have determined it to be glandulous; and Ruyſch makes it vaſculous, declaring it to be formed of a congeries of very minute veſſels.

Having already given the external figure of the liver in grown perſons, under the article INTESTINES, we ſhall here give that of a new-born fœtus, whereby the difference between them will be the more readily apprehended. AAAA (plate CLXI. fig. 1.) repreſents the circumference of the liver; BBBB, the lower part of the liver, in which there are ſeveral irregularities; C, the gall-bladder; D, the umbilical vein, running with a ſingle trunk from the navel to the liver; EEE, the ſinuſes of the vena portæ, into which alone the umbilical vein inſerts itſelf, with a ſingle trunk; F, the trunk of the vena portæ cut off; GGGG, the principal branches of the ſinus of the vena portæ diſtributed through the liver, which become conſpicuous when a ſmall part of the ſuperficies of the liver is abraded off; H, the trunk of the vena cava; I, the canalis venoſus, or ductus venoſus, ariſing from the ſinus of the vena portæ over-againſt the ingreſs of the umbilical vein, and inſerting itſelf into the vena cava: this, in the uterus, carries a great part, and probably the greater part of the blood, carried through the umbilical vein to the liver of the fœtus, by a large paſſage to the vena cava and the heart; but this, after the birth of the fœtus, gradually grows narrower and cloſes; K, the entrance of the umbilical vein into the ſinus of the vena portæ.

To this deſcription of the external parts of the liver, it may not be improper to add that of its blood-veſſels, together with their numerous ramifications, freed from the parenchymatous ſubſtance. Fig. 2. *ibid.* repreſents the under ſide of the veſſels; A being that part of the liver which lies next to the back; B, its right ſide; C, its anterior edge. D, its left ſide; E, the vena cava, where it paſſes through the diaphragm; E 1, E 2, E 3, its three principal branches diſtributed almoſt through the whole liver; F, the vena portæ turned upwards, that other veſſels may be more eaſily ſeen; F 1, F 2, F 3, F 4, four branches of the vena portæ diſtributed to ſeveral quarters of the lower part of the liver, but the fifth branch not obſerved on this ſide; G, the gall-bladder; H, H, the vena umbilicalis become a ligament; I, the ductus communis choledochus; K, the canalis venoſus now performing the office of a ligament; L, the trunk of the vena cava deſcendens; *a*, a ſmall portion of the membrane inveſting the liver; *b*, that part of the diaphragm which ſurrounds the vena cava; *c*, the biliary duct; *d*, the cyſtic duct; *e*, the place where theſe veſſels meet; *f*, the hepatic artery; *o*, *o*, the hepatic nerves; *p*, *p*, *p*, *p*, the common capſule laid open; *q* *q*, the lymphæducts; *m*, *m*, &c. the ſmaller branches of the vena

Fig. 1. The LIVER of a Fœtus

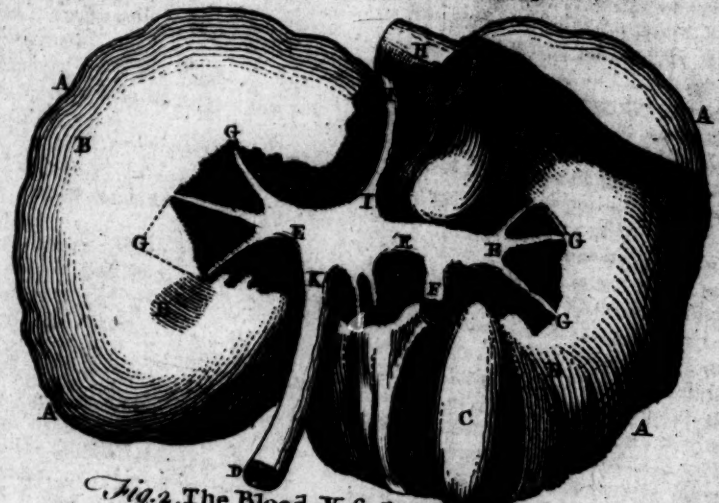
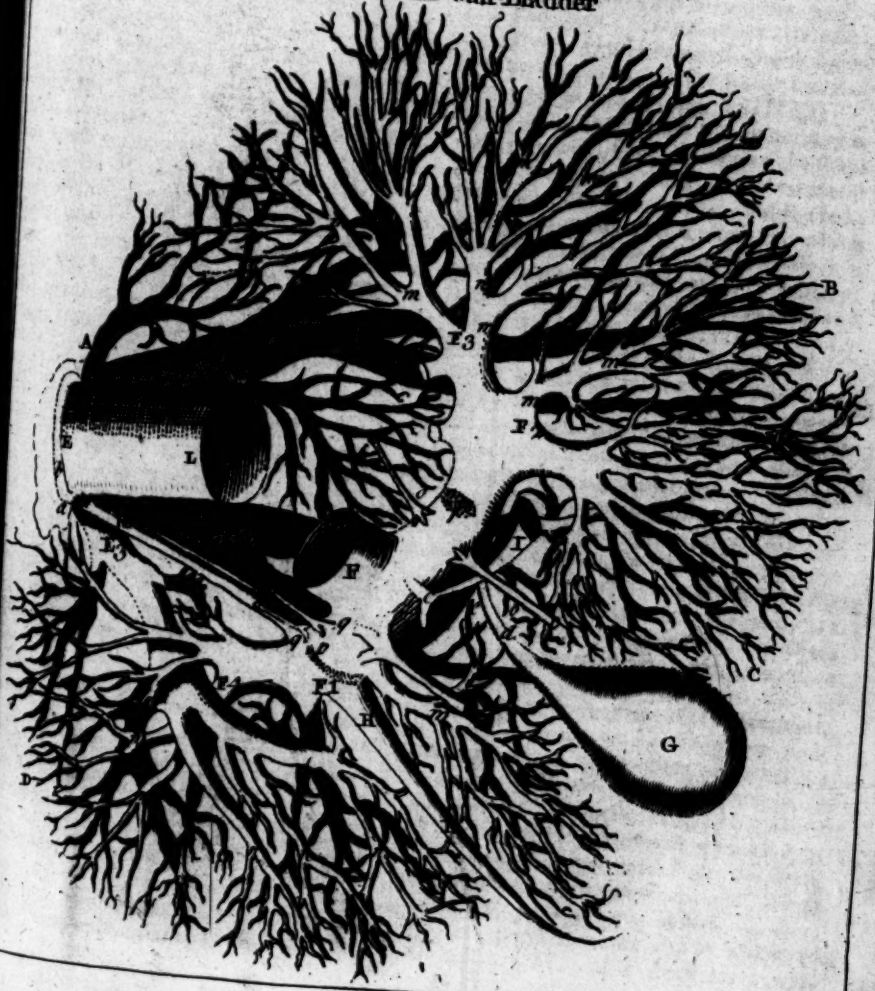


Fig. 2. The Blood-Vessels of the LIVER, together with the Gall-Bladder



J. Jeffery's sculp.

BRITISH MUSEUM

portæ; *n*, *n*, *n*, *&c.* the ſmall branches of the vena cava.

Inflammation of the LIVER. See the article INFLAMMATION.

LIVER *of ſulphur*, &c. See HEPAR.

LIVER-WORT, *lichen*, in botany. See the article LICHEN.

LIVERPOOL, or LEVERPOOL, a port-town of Lancaſhire, fifteen miles north of Cheſter, which ſends two members to parliament.

LIVERY, in matters of dreſs and equipage, a certain colour and form of dreſs, by which noblemen and gentlemen chooſe to diſtinguiſh their ſervants.

LIVERY *of ſeiſin*, in law, ſignifies delivering the poſſeſſion of lands, *&c.* to him who has a right to them. There are two kinds of livery and ſeiſin; livery in law, where the feoffer being in view of the land, houſe, or other thing granted, ſays to the feoffee on delivery of the deed, "I give to you yonder land, *&c.* "to hold to you and your heirs, ſo go "into the ſame, and take poſſeſſion ac-"cordingly." And livery in deed, is where the parties, or the attornies by them authorized, coming to the door of the houſe, or upon ſome part of the land, declare the occaſion of their meeting before witneſſes, read the deed, or its contents, and in caſe it be made by attorney, the letter of attorney is alſo read, after which, if the delivery be of a houſe, the grantor, or his attorney, takes the ring, key, or latch belonging to the door, or if it be land, a turf, or clod of earth, and a twig of one of the trees, and delivering them with the deed to the grantee or his attorney, ſays, "I A. B. do "hereby deliver to you poſſeſſion and "ſeiſin of this meſſuage or tenement, "*&c.* to hold to you, your heirs and "aſſigns, according to the purport, true "intent, and meaning of this indenture, "or deed of feoffment." After which the grantee enters firſt alone, and ſhutting the door, and then opening it, lets in others.

When both a houſe and lands are conveyed, the houſe is looked upon as principal, and therefore the livery is made there. If lands lie in different parts of the ſame county, the livery and ſeiſin of one part in one place, in the name of the whole granted in the feoffment, is ſufficient; yet when they lie in different counties, livery and ſeiſin muſt be made in each. If a perſon grants a leaſe for years, with remainder to another for life, or in tail, *&c.* the livery and ſeiſin muſt be made to the leſſee for years, without which nothing will paſs to the perſon in remainder.

Since the making the ſtatute of uſes, livery and ſeiſin are not ſo much uſed as formerly; for a leaſe and releaſe, a bargain and ſale by deed inrolled, are ſufficient to veſt the grantee with poſſeſſion, without the formality of livery.

LIVERYMEN, of London, are a number of men choſen from among the freemen of each company. Out of this body the common council, ſheriff, and other ſuperior officers for the government of the city are elected, and they alone have the privilege of giving their votes for members of parliament; from which the reſt of the citizens are excluded.

LIVONIA, a province of Ruſſia, 160 miles long, and 120 broad; bounded by the gulph of Finland, on the north; by Ingria and great Novogorod, on the eaſt; by Lithuania and Courland, on the ſouth; and by the Baltic, on the weſt: its chief towns are Narva, Revel, and Riga.

LIVONICA TERRA, in the materia medica, a kind of fine bole uſed in the ſhops of Germany and Italy, of which there are two ſpecies, the yellow, and the red; the diſtinguiſhing characters of which are theſe: the yellow livonian earth is a pure and perfectly fine bole, of a ſhattery, friable texture, conſiderably heavy, and of a dull, duſky yellow, which has uſually ſome faint bluſh of reddiſhneſs in it: it is of a ſmooth ſurface, and does not ſtain the hands; it adheres firmly to the tongue, and melts freely in the mouth, leaving no grittineſs between the teeth, and does not ferment with acid menſtrua. The red livonian earth is an impure bole, of a looſe texture, and of a pale red: it is of a ſmooth ſurface, breaks eaſily between the fingers, and does not at all ſtain the hands; it melts freely in the mouth, has a very ſtrongly aſtringent taſte, but leaves a grittineſs between the teeth, and does not ferment with acid menſtrua. Theſe earths are both dug out of the ſame pit, in the place from whence they have their name, and in ſome other parts of the world. They are generally brought to us made up into little cakes, and ſealed with the impreſſion of a church, and an eſcutcheon with two croſs keys. In Spain and Portugal they are much uſed, ſometimes ſingly, ſometimes mixed together, and are good in fevers and in fluxes of all kinds. The red is the more power-

ful aſtringent. The Spaniards and Portugueze make alſo a light kind of earthen ware of them.

LIVRE, a french money of account, containing twenty ſols. See the articles COIN and MONEY.

LIXIVIOUS, an appellation given to ſalts, obtained from burnt vegetables by lotion. See the article SALT.

LIXIVIUM, in pharmacy, *&c.* a ley, obtained by pouring ſome liquor upon the aſhes of plants; which is more or leſs powerful, as it has imbibed the fixed ſalts contained in the aſhes.

Lixiviums are not only uſeful in medicine, but in many manufactures, dyeing, bleaching, *&c.* See DYEING and BLEACHING.

The lixivium ſaponarium, or ſoap leys, is a form of medicine mentioned in the London diſpenſatory, and ordered to be made in the following manner: Take equal weights of ruſſia-potaſh, and quick-lime, and throw water upon them by degrees, till the lime is ſlacked; then throw on more water, and ſtir all together, that the ſalt of the aſhes may be diſſolved; after ſome time pour the liquor, filtered through paper, if needful, into another veſſel. It is much uſed in caſes of the ſtone.

LIZARD, *lacerta*, in zoology, a genus of amphibious animals, the body of which is oblong and rounded, the legs four, and the hinder part terminated by a tapering tail.

The ſpecies of lizards are very numerous, being diſtinguiſhed chiefly by the number of their toes. See plate CLXII. fig. 1. where, n° 1. repreſents the long-tailed lizard, called from the fierceneſs of its aſpect, the lion-lizard; and n° 2. another lizard with five toes on each foot, and a long and rounded tail, and plicated ſides.

LIZARD, in geography, a cape, or promontary of Cornwall, fifteen miles ſouth of Falmouth: weſt long. 5° 47′, north lat. 49° 50′.

LOACH the engliſh name of a fiſh, called by Artedi, the ſmooth ſpotted cobitis, with a cylindrical body. See COBITIS.

LOAD, among miners, denotes a vein of ore. See the article MINE.

It is alſo uſed for nine diſhes of ore. See the article DISH.

LOADSTONE, the ſame with magnet. See the article MAGNET.

LOAMS, in natural hiſtory, are defined to be earths compoſed of diſſimilar particles, hard, ſtiff, denſe, and hard and rough to the touch; not eaſily ductile while moiſt, readily diffuſible in water, and compoſed of ſand, and a tough vifcid clay. Of theſe loams, ſome are whitiſh, and others brown or yellow.

LOBE, in anatomy, any fleſhy protuberant part, as the lobes of the lungs, lobes of the ears, *&c.* See LUNGS and EAR.

LOBELIA, in botany, a genus of the ſyngeneſia-polygamia claſs of plants, the flower of which is monopetalous, and ſlightly ringent: the fruit is an oval capſule, containing a great number of very ſmall ſeeds.

LOCAL, in law, ſomething fixed to the freehold, or tied to a certain place: thus real actions are local, ſince they muſt be brought in the country where they lie; and local cuſtoms are thoſe peculiar to certain countries and places.

LOCAL COLOURS, in painting, ſuch as are natural, and proper for each object in a picture. See the article PICTURE.

LOCAL MEDICINES, thoſe deſtined to act upon particular parts: ſuch are fomentations, epithems, veſicatories, *&c.* See the article FOMENTATION, *&c.*

LOCAL PROBLEM, among mathematicians, ſuch a one as is capable of an infinite number of different ſolutions, by reaſon that the point which is to reſolve the problem may be indifferently taken within a certain extent, as ſuppoſe any where within ſuch a line, within ſuch a plane figure, *&c.* which is called a geometrical locus, and the problem is ſaid to be a local or indetermined one. See LOCUS.

A local problem may be either ſimple, when the point ſought is in a right line or plane, when the point ſought is in the circumference of a circle; ſolid, when the point required is in the circumference of a conic ſection; or laſtly, ſurſolid, when the point is in the perimeter of a line of the ſecond gender, or of an higher kind, as geometers call it.

LOCATELLUS's BALSAM, in pharmacy, a celebrated balſam, the preparation whereof is directed in the London diſpenſatory as follows: Take of oil-olive one pint; Straſburg turpentine and yellow wax, each half a pound; red ſaunders ſix drams; melt the wax over a gentle fire, with ſome part of the oil; then add the reſt of the oil and the turpentine; afterwards mix in the ſaunders, and keep them ſtirring together until the mixture is grown cold. The Edinburgh diſpenſatory directs it to be made thus: Take of yellow wax, one pound; oil-olive, a pint and a half; Venice turpentine, pound

pound and a half; balſam of Peru, two ounces; dragon's blood, one ounce; melt the wax in the oil over a gentle fire; then add the turpentine, and having taken them from the fire, mix in the balſam of Peru and dragon's blood, keeping them continually ſtirring till grown cold.

This balſam is uſed in internal bruiſes and hæmorrhages, eroſions of the inteſtines, ulcerations of the lungs, dyſenteries, and in ſome coughs and aſthmas; the doſe is from two ſcruples to two drams; it may be commodiouſly exhibited along with about double its weight of conſerve of roſes; ſome have likewiſe applied it externally, for deterging and incarnating recent wounds and ulcers.

OCHABER, See LOQUABYR.

OCHIA, in medicine, a flux from the uterus, conſequent to delivery. See the article DELIVERY.

This flux proceeds from the appendices cæcæ, after the ſeparation of the placenta, and is uſeful and even neceſſary to unload the veſſels of the womb: it is at firſt bloody, and retains a ſanguine colour for three or four days, till at length it becomes like the waſhings of fleſh. In ten or twelve days it is milky, and at laſt lymphatic: though, in ſome, it continues but twelve hours, in others twenty-four.

After delivery, therefore, the woman ſhould be put to bed, and a folded ſheet put under her to receive the lochia: warm linen ſhould alſo be applied to the genital parts, to keep out the air; and a compreſs, dipt in warm wine, ſhould be applied to the belly, but not too tight. When the flux of the lochia is moderate, it requires no aſſiſtance; but if immoderate, which very frequently happens, it is attended with weakneſs, loathing, fainting, convulſions, a ſlow, weak, or intermitting pulſe, exceſſive paleneſs, dimneſs of ſight, and a tingling in the ears. In this caſe, Aſtruc directs bleeding; and if any part of the placenta remains in the womb, it ſhould be ſearched for, and taken out. Internally attemperating medicines are to be given, to quiet the commotion of the blood: ſuch are nitre, crabs-eyes, cinnabar, and other alkaline abſorbents; and if theſe are inſufficient, the milder aſtringents are to be called in. Sydenham recommends an incraſſating diet, and the following drink: mix equal quantities of plantain-water, and red wine, which boil down one third, ſweetening it with ſugar; and of this, when cold, let the patient drink half a pound twice or thrice a-day.

If an immoderate flux of the lochia be dangerous, a ſuppreſſion of it is more ſo; the abdomen ſwells; the breathing is difficult; and faintings, cold ſweats, and the rigours of acute fevers ſupervene. In this caſe, if the patient's ſtrength will permit, let blood, and give her an emollient and diluent ptiſan of althæa, as alſo emollient clyſters; applying fomentations of marſh-mallows on the region of the uterus. If theſe give eaſe, you may preſcribe gentle aperitives, as ſaffron taken like tea; and her feet ſhould be bathed in warm water. If the flux is only diminiſhed, you may give tincture of myrrh, amber, and ſaffron, together or ſingle, in ſmall doſes, in tea, often in a day, or elixir proprietatis. If the lochia are quite ſuppreſſed, there is almoſt always a fever; in which caſe, all forcing medicines are unſafe; and therefore bleeding in the foot, in plethoric perſons, will be proper, with attemperating, abſorbent, and nitrous powders, diaphoretic potions, and aqueous liquors, as in acute fevers. See the article FEVER.

LOCHMABEN, a town of Scotland, fifteen miles eaſt of Dumfries.

LOCK, an inſtrument uſed for faſtening doors, cheſts, &c. generally opened by a key. See the article KEY.

The lock is eſteemed the maſter piece in ſmithery; much art and delicacy being required in contriving and varying the wards, bolts and ſprings. From the different ſtructure of locks, accommodated to their different uſe, they acquire different names: thus thoſe placed on outer doors are called ſtock-locks; thoſe on inner doors, ſpring-locks; thoſe on trunks, trunk-locks, pad-locks, &c. Of theſe the ſpring-lock is the moſt curious: its principal parts are, the main-plate, the cover-plate, and the pin-hole: to the main plate belong the key-hole, top-hook, croſs-wards, bolt-toe, or bolt-nab, drawback ſpring, tumbler, pin of the tumbler, and the ſtaples; to the cover-plate belong the pin, main-ward, croſs-ward, ſtep-ward, or dapper-ward; to the pin-hole belong the hook-ward, main croſs-ward, ſhank, the pot or bread, bit, and bow-ward. The importation of locks is prohibited.

LOCKMAN, an officer in the Iſle of Man, who executes the orders of the government, much like our under ſheriff.

LOCRIDA,

LOCRIDA, a town of Turky in Europe, ſeventy miles ſouth-eaſt of Durazzo: eaſt long. 21°, north lat. 41°.

LOCUS GEOMETRICUS, denotes a line, by which a local or indeterminate problem is ſolved. See LOCAL PROBLEM.

A locus is a line, any point of which may equally ſolve an indeterminate problem. Thus, if a right line ſuffice for the conſtruction of the equation, it is called *locus ad rectum*; if a circle, *locus ad circulum*; if a parabola, *locus ad parabolam*; if an ellipſis, *locus ad ellipſin*; and ſo of the reſt of the conic ſections.

The loci of ſuch equations as are right lines, or circles, the antients called *plain loci*; and of thoſe that are parabolas, hyperbolas, &c. *ſolid loci*. But Wolfius, and others, among the moderns, divide the loci more commodiouſly into orders, according to the numbers of dimenſions to which the indeterminate quantities riſe. Thus, it will be a locus of the firſt order, if the equation is $x = \frac{ay}{c}$; a locus of the ſecond or quadratic order, if $y^2 = ax$, or $y^2 = a^2 - x^2$; a locus of the third or cubic order, if $y^3 = a^2x$, or $y^3 = ax^2 - x^3$, &c.

The better to conceive the nature of the locus, ſuppoſe two unknown and variable right lines AP, PM (plate CLIX. fig. 4. n° 1, 2.) making any given angle APM with each other; the one whereof, as AP, we call x, having a fixed origin in the point A, and extending itſelf indefinitely along a right line given in poſition; the other PM, which we call y, continually changing its poſition, but always parallel to itſelf. An equation only containing theſe two unknown quantities x and y, mixed with known ones, which expreſſes the relation of every variable quantity AP (x) to its correſpondent variable quantity PM (y): the line paſſing through the extremities of all the values of y, *i. e.* through all the points M, is called a *geometrical locus*, in general, and the locus of that equation in particular.

All equations, whoſe loci are of the firſt order, may be reduced to ſome one of the four following formulas: 1. $y = \frac{bx}{a}$. 2. $y = \frac{bx}{a} + c$. 3. $y = \frac{bx}{a} - c$. 4. $y = c - \frac{bx}{a}$. Where the unknown quantity y, is ſuppoſed always to be freed from fractions, and the fraction that multiplies the other unknown quantity x, to be reduced to this expreſſion $\frac{b}{a}$, and all the known terms to c.

The locus of the firſt formula being already determined: to find that of the ſecond, $y = \frac{bx}{a} + c$; in the line AP, (n° 3.) take AB $= a$, and draw BE $= b$, AD $= c$ and parallel to PM. On the ſame ſide AP, draw the line AE of an indefinite length towards E, and the indefinite ſtraight line DM parallel to AE. Then the line DM is the locus of the aforeſaid equation, or formula; for if the line MP be drawn from any point M thereof parallel to AQ, the triangles ABE, and APF, will be ſimilar: and therefore AB (a) : BE (b) :: AP (x) PF $= \frac{bx}{a}$; and conſequently PM $(y) =$ PF $\left(= \frac{bx}{a}\right) +$ FM (c).

To find the locus of the third form, $y = \frac{bx}{a} - c$, proceed thus: aſſume AB $=$ (n° 4.); and draw the right lines BE $= b$, AD $= c$ and parallel to PM, the one on one ſide AP, and the other on the other ſide: and through the points A, E, draw the line AE of an indefinite length towards E, and thro' the point D, the line DM parallel to AE: then the indefinite right line GM ſhall be the locus ſought; for we ſhall have always PM $= (y) =$ PF $= \left(\frac{bx}{a}\right) -$ FM (c).

Laſtly, to find the locus of the fourth formula, $y = c - \frac{bx}{a}$; in AP (n° 5.) take AB $= a$, and draw BE $=$ AD $= c$, and parallel to PM, the one on one ſide AP, and the other on the other ſide; and through the points A, and E, draw the line AE indefinitely towards E, and through the point D draw the line DM parallel to AE. Then DM ſhall be the locus ſought; for if the line MP be drawn from any point M thereof, parallel to AQ, then we ſhall always have PM $=$ FM $-$ PF, that is $y = c - \frac{bx}{a}$.

Hence it appears, that all the loci of the firſt degree are ſtraight lines; which may be eaſily found, becauſe all their equa-

tions may be reduced to ſome one of the foregoing formulas.

All loci of the ſecond degree are conic ſections, *viz.* either the parabola, the circle, ellipſis, or hyperbola: if an equation therefore be given, whoſe locus is of the ſecond degree, and it be required to draw the conic ſection, which is the locus thereof; firſt draw a parabola, ellipſis, or hyperbola; ſo as that the equations expreſſing the natures thereof may be as compound as poſſible. In order to get general equations, or formulas, by examining the peculiar properties whereof we may know which of theſe formulas the given equation ought to have regard to; that is, which of the conic ſections will be the locus of the propoſed equation. This known, compare all the terms of the propoſed equation with the terms of the general formula of that conic ſection, which you have found will be the locus of the given equation; by which means you will find how to draw the ſection, which is the locus of the equation given.

For example; let AP $= x$, PM $= y$, be unknown, and variable ſtraight lines (n° 6.); and let m, n, p, r, s, be given right lines: in the line AP take AB $= m$, and draw BE $= n$, AD $= r$ and parallel to PM; and through the point A draw AE $= e$, and through the point D the indefinite right line DG parallel to AE. In DG take DC $= s$, and with CG, as a diameter, having its ordinates parallel to PM, and the line CH $= p$, as the parameter, deſcribe a parabola CM: then the portion thereof, included in the angle PAD, will be the locus of the following general formula:

$$yy - \frac{2nxy}{m} + \frac{nnxx}{mm} - 2ry + \frac{2nrx}{m} + rr - \frac{epx}{m} + ps. = o.$$

For if from any point M of that portion there be drawn the right line MP, making any angle APM with MP; the triangles ABE, APF, ſhall be ſimilar; therefore,

AB: AE :: AP : AF or DG; that is, $m : e :: x : \frac{ex}{m}$. And AB : BE :: AP : PF; that is, $m : n :: x : \frac{nx}{m}$. And conſequently GM or PM — PF — FG $= y - \frac{nx}{m} - r$. And CG or DG — DC $= \frac{ex}{m} - s$. But from the nature of the parabola $GM^2 = CG \times CH$; which equation will become that of the general formula, by putting the literal values of thoſe lines.

Again, if through the fixed point A you draw the indefinite right line AQ (n° 7.) parallel to PM, and you take AB $= m$, and draw BE $= n$ and parallel to AP, and thro' the determinate points A, E, the line AE $= e$; and if in AP you take AD $= r$: and draw the indefinite ſtraight line DG parallel to AE, and take DC $= s$: This being done, if with the diameter CG, whoſe ordinates are parallel to AP, and parameter the line CH $= p$, you deſcribe a parabola CM; the portion of this parabola contained in the angle BAP ſhall be the locus of this ſecond equation, or formula:

$$xx - \frac{2nyx}{m} + \frac{nnyy}{mm} - 2rx + \frac{2nry}{m} + rr - \frac{epy}{m} + ps. = o.$$

For if the line MQ be drawn from any point M, therein, parallel to AP; then will, AB : AE :: AQ or PM : AF or DG; that is, $m : e :: y : \frac{ey}{m}$; and AB : BE :: AQ : QF; that is, $m : n :: y : \frac{ny}{m}$. And therefore GM or QM — QF — FG $= x - \frac{ny}{m} - r$; and CG or DG — DC $= \frac{ey}{m} - s$.

And ſo by the common property of the parabola, you will have the foregoing ſecond equation, or formula. So likewiſe may be found general equations for the other conic ſections.

Now if it be required to draw the parabola, which we find to be the locus of this propoſed equation $yy - 2ay - bx + cc = o$; compare every term of the firſt formula with the terms of the equation, becauſe yy in both is without fractions; and then will $\frac{2n}{m} = o$, becauſe the rectangle xy not being in the propoſed equation, the ſaid rectangle may be eſteemed as multiplied by o; whence $n = o$, and $m = e$; becauſe the line AE falling in AB, that is, in AP in the conſtruction of the formula, the points B, E, do coincide. Therefore deſtroying all the terms adfected with $\frac{n}{m}$ in the formula, and ſubſtituting m for e, we ſhall get yy

$-2ry-px+rr+ps=o$. Again, by comparing the correſpondent terms $-2ry$ and $-2ay$, as alſo $-px$ and $-bx$, we have $r=a$, and $p=b$; and comparing the terms wherein are neither of the unknown quantities x, y, we get $rr+ps=cc$; and ſubſtituting a and b, for r and p, then will $s=\frac{cc-aa}{b}$, which is a negative expreſſion when a is greater than c, as is here ſuppoſed. There is is no need of comparing the firſt terms yy and yy, becauſe they are the ſame. Now the values of n, r, p, s, being thus found, the ſought locus may be conſtructed by means of the conſtruction of the formula, and after the following manner.

Becauſe $BE=n=o$ (n° 8.) the points B, E, do coincide, and the line AE falls in AP; therefore thro' the fixed point A draw the line $AD=r=a$ parallel to PM, and draw DG parallel to AP, in which take $DC=\frac{aa-cc}{b}=-s$; then with DC, as a diameter, whoſe ordinates are right lines parallel to PM, and parameter the line $CH=p=b$, deſcribe a parabola: then the two portions OMM, RMS, contained in the angle PAO, formed by the line AP, and the line AO drawn parallel to PM, will be the locus of the given equation, as is eaſily proved.

If in a given equation whoſe locus is a parabola, xx is without a fraction; then the term of the ſecond formula muſt be compared with thoſe of the given equation.

Thus much for the method of conſtructing the loci of the equations which are conic ſections. If, now, an equation, whoſe locus is a conic ſection, be given, and the particular ſection whereof it is the locus be required: all the terms of the given equation being brought over to one ſide, ſo that the other be equal to nothing, there will be two caſes.

Caſe I. When the rectangle xy is not in the given equation. 1. If either yy or xx be in the ſame equation, the locus will be a parabola. 2. If both xx and yy are in the equation with the ſame ſigns, the locus will be an ellipſis, or a circle. 3. If xx and yy have different ſigns, the locus will be an hyperbola, or the oppoſite ſections regarding their diameters.

Caſe II. When the rectangle xy is in the given equation. 1. If neither of the ſquares xx or yy, or only one of them, be in the ſame, the locus of it will be an hyperbola between the aſymptotes. 2. If yy and xx be therein, having different ſigns, the locus will be an hyperbola regarding its diameters. 3. If both the ſquares xx and yy are in the equation, having the ſame ſigns, you muſt free the ſquare yy from fractions; and then the locus will be an hyperbola, when the ſquare of $\frac{1}{2}$ the fraction multiplying xy is equal to the fraction multiplying xx, an ellipſis, or circle, when the ſame is leſs; and an hyperbola, or the oppoſite ſections, regarding their diameters, when greater.

LOCULAMENT, among botaniſts, denotes a cell, or partition, in a ſeed-pod, for the ſeed of a plant. See PLANT.

In one plant we meet with one loculament in a pod; in others, with two, three, or more.

LOCUST, *locuſta*, in zoology, the name of ſeveral ſpecies of gryllus. See the article GRYLLUS.

The great green locuſt, with a ſtraight enſiform tail, is near two inches in length, and about the thickneſs of a man's little finger; it is common in paſtures, in many parts of Europe; and is called by authors, locuſta viridis major.

The country of the Coſſacks, in dry ſummers, is much infeſted with prodigious ſwarms of locuſts; which devour all the corn and paſture.

LOCUST-TREE, in botany, a name by which the people of the Weſt-Indies call a ſpecies of acacia. See ACACIA.

LODGMENT, in military affairs, is a work raiſed with earth, gabions, faſcines, wool-packs, or mantelets, to cover the beſiegers from the enemies fire, and to prevent their loſing a place which they have gained, and are reſolved, if poſſible, to keep. For this purpoſe, when a lodgment is to be made on the glacis, covert-way, or in a breach, there muſt be great proviſion made of faſcines, ſand-bags, &c. in the trenches; and during the action, the pioneers with faſcines, ſand-bags, &c. ſhould be making the lodgment, in order to form a cover in as advantageous a manner as poſſible from the oppoſite baſtion, or the place moſt to be f-ared.

LOEFLINGIA, in botany, a genus of the triandria monogynia claſs of plants, the calyx of which is a five-leaf-d, erect perianthium; the corolla conſiſts of five very ſmall, oblong, oval petals forming a globe: the fruit is an oval three-cornered capſule, compoſed of

three valves, and containing three cells; the ſeeds are numerous and oval.

LOESELIA, in botany, a genus of the didynamia-angioſpermia claſs of plants, the flower of which is monopetalous, and quinquifid at the limb: the fruit is a trilocular capſule, with ſeveral angulated ſeeds in each cell.

LOG, in naval affairs, is a flat piece of wood, ſhaped ſomewhat like a flounder, with a piece of lead faſtened to its bottom, which makes it ſtand or ſwim upright in the water. See plate CLXII. fig. 2.

To this log is faſtened a long line, called the log-line; and this is commonly divided into certain ſpaces fifty feet in length, by knots, which are pieces of knotted twine, inreeved between the ſtrands of the line; which ſhew, by means of an half minute glaſs, how many of theſe ſpaces or knots are run out in half a minute. They commonly begin to be counted at the diſtance of about ten fathoms, or ſixty feet from the log; that ſo the log, when it is hove over-board, may be out of the eddy of the ſhip's wake before they begin to count, and for the ready diſcovery of this point of commencement, there is commonly faſtened at it a red rag.

The log being thus prepared, and hove over-board from the poop, and the line veered out by the help of a reel, as faſt as the ſhip ſails from it, will ſhew how far the ſhip has run in a given time; and conſequently her rate of ſailing.

Hence it is evident, that as the diſtance of the knots bears the ſame proportion to a mile, as half a minute does to an hour, whatever number of knots the ſhip runs in half a minute, the ſame number of miles ſhe will run in an hour, ſuppoſing her to run with the ſame degree of velocity during that time; and therefore, in order to know her rate of ſailing, it is the general way to heave the log every hour; but if the force or direction of the wind vary, and does not continue the ſame during the whole hour, or if there has been more ſail ſet, or any ſail handed in, by which the ſhip has ſailed faſter or ſlower than ſhe did at the time of heaving the log, there muſt then be an allowance made for it accordingly.

LOG-BOARD, a table generally divided into five columns, in the firſt of which is entered the hour of the day; in the ſecond, the courſe ſteered; in the third, the number of knots ran off the reel each time of heaving the log; in the fourth, from what point the wind blows; and in the fifth, obſervations on the weather, variation of the compaſs, &c.

LOG-BOOK, a book ruled in columns like the log-board, into which the account on the log-board is tranſcribed every day at noon; from whence, after it is corrected, &c. it is entered into the journal.

LOG-WOOD, in commerce, the wood of a tree called, by botaniſts, hæmatoxylum. See the article HÆMATOXYLUM.

Logwood is uſed by dyers, for dyeing blacks and blues.

LOGARITHMIC, in general, ſomething belonging to logarithms. See the article LOGARITHMS.

LOGARITHMIC CURVE. If on the line AN (plate CLII. fig. 3.) both ways indefinitely extended, be taken, AC, CE, EG, GI, IL, on the right hand. And alſo A*g*, *g*P, &c. on the left, all equal to one another. And, if at the points P, *g*, A, C, E, G, I, L, be erected to the right line, AN, the perpendiculars PS, *g d*, AB, CD, EF, GH, IK, LM, which let be continually proportional, and repreſent numbers, *viz.* AB, 1; CD, 10, EF 100, &c. then ſhall we have two progreſſions of lines, arithmetical and geometrical: for the lines AC, AE, AG, &c. are in arithmetical progreſſion, or as 1, 2, 3, 4, 5, &c. and ſo repreſent the logarithms to which the geometrical lines AB, CD, EF, &c. do correſpond. For ſince AG is triple of the right line AC, the number GH ſhall be in the third place from unity, if CD be in the firſt: ſo, likewiſe, ſhall LM be in the fifth place, ſince AL = 5 AC. If the extremities of the proportionals S, *d*, B, D, F, &c. be joined by right lines, the figure SBML will become a polygon, conſiſting of more or leſs ſides, according as there is more or leſs terms in the progreſſion.

If the parts AC, CE, EG, &c. be biſected in the points *c*, *e*, *g*, *i*, *l*, and there be again raiſed the perpendiculars *c d*, *e f*, *g h*, *i k*, *l m*, which are mean proportionals between AB, CD; CD, EF, &c. then there will ariſe a new ſeries of proportionals, whoſe terms beginning from that which immediately follows unity, are double of thoſe in the firſt ſeries, and the difference of the terms are become leſs, and approach nearer to a ratio of equality than before. Likewiſe, in this new ſeries, the right lines AL, A*c*, expreſs the diſtances

of the terms L M, *c d*, from unity; *viz.* ſince A L is ten times greater than A *c*, L M ſhall be the tenth term of the ſeries from unity; and, becauſe A *e* is three times greater than A *c*, *e f* will be the third term of the ſeries if *c d* be the firſt, and there ſhall be two mean proportionals between A B and *e f*; and between A B and L M there will be nine mean proportionals. And if the extremities of the lines B *d*, D *f*, F *h*, *&c.* be joined by right lines, there will be a new polygon made, conſiſting of more but ſhorter ſides than the laſt.

If, in this manner, mean proportionals be continually placed between every two terms, the number of terms at laſt will be made ſo great, as alſo the number of the ſides of the polygon, as to be greater than any given number, or to be infinite; and every ſide of the polygon ſo leſſened, as to become leſs than any given right line; and conſequently the polygon will be changed into a curve-lined figure: for any curve-lined figure may be conceived as a polygon, whoſe ſides are infinitely ſmall and infinite in number. A curve deſcribed after this manner, is called logarithmical.

It is manifeſt from this deſcription of the logarithmic curve, that all numbers at equal diſtances are continually proportional. It is alſo plain, that if there be four numbers, A B, C D, I K, L M, ſuch that the diſtance between the firſt and ſecond, be equal to the diſtance between the third and the fourth; let the diſtance from the ſecond to the third be what it will, theſe numbers will be proportional. For becauſe the diſtances A C, I L, are equal, A B ſhall be to the increment D *s*, as I K is to the increment M T. Wherefore, by compoſition, A B : D C :: I K : M L. And, contrariwiſe, if four numbers be proportional, the diſtance between the firſt and ſecond ſhall be equal to the diſtance between the third and fourth.

The diſtance between any two numbers, is called the logarithm of the ratio of thoſe numbers; and, indeed, doth not meaſure the ratio itſelf, but the number of terms in a given ſeries of geometrical proportionals, proceeding from one number to another, and defines the number of equal ratios by the compoſition whereof the ratio of numbers are known.

LOGARITHMS, are the indexes or exponents (moſtly whole numbers and decimal fractions, conſiſting of ſeven places of figures at leaſt) of the powers or roots (chiefly broken) of a given number; yet ſuch indexes or exponents, that the ſeveral powers or roots they expreſs, are the natural numbers 1, 2, 3, 4, 5, *&c.* to 10 or 100000, *&c.* (as if the given number be 10, and its index be aſſumed 1 0000000, then the 0.0000000 root of 10, which is 1, will be the logarithm of 1; the 0.301036 root of 10, which is 2, will be the logarithm of 2; the 0.477121 root of 10 which is 3, will be the logarithm of 3; the 0.612060 root of 10, the logarithm of 4; the 1.041393 power of 10 the logarithm of 11; the 1.079181 power of 10 the logarithm of 12, *&c.*) being chiefly contrived for eaſe and expedition in performing of arithmetical operations in large numbers, and in trigonometrical calculations; but they have likewiſe been found of extenſive ſervice in the higher geometry, particularly in the method of fluxions. They are generally founded on this conſideration, that if there be any row of geometrical proportional numbers, as 1, 2, 4, 8, 16, 32, 64, 128, 256, *&c.* or 1, 10, 100, 1000, 10000, *&c.* And as many arithmetical progreſſional numbers adapted to them, or ſet over them, beginning with 0, thus, $\left\{\begin{matrix}0, & 1, & 2, & 3, & 4, & 5, & 6, & 7, & \&c.\\ 1, & 2, & 4, & 8, & 16, & 32, & 64, & 128, & \&c.\end{matrix}\right.$ or, $\left\{\begin{matrix}0, & 1, & 2, & 3, & 4, & \&c.\\ 1, & 10, & 100, & 1000, & 10000, & \&c.\end{matrix}\right.$ Then will the ſum of any two of theſe arithmetical progreſſionals, added together, be that arithmetical progreſſional which anſwers to, or ſtands over the geometrical progreſſional, which is the product of the two geometrical progreſſionals over which the two aſſumed arithmetical progreſſionals ſtand: again, if theſe arithmetical progreſſionals be ſubtracted from each other, the remainder will be the arithmetical progreſſional ſtanding over that geometrical progreſſional which is the quotient of the diviſion of the two geometrical progreſſionals belonging to the two firſt aſſumed arithmetical progreſſionals; and the double, triple, *&c.* of any one of the arithmetical progreſſionals, will be the arithmetical progreſſional ſtanding over the ſquare, cube, *&c.* of that geometrical progreſſional which the aſſumed arithmetical progreſſional ſtands over, as well as the $\frac{1}{2}$, $\frac{1}{3}$, *&c.* of that arithmetical progreſſional, will be the geometrical progreſſional anſwering to the ſquare root, cube root, *&c.* of the arithmetical progreſſional over it:

from hence arises the following common, though lame and imperfect definition of logarithms; *viz.*

That they are so many arithmetical progressionals, answering to the same number of geometrical ones. Whereas, if any one looks into the tables of logarithms, he will find, that these do not all run on in an arithmetical progression, nor the numbers they answer to in a geometrical one; these last being themselves arithmetical progressionals. Dr. Wallis, in his history of algebra, calls logarithms, the indexes of the ratios of numbers to one another. Dr. Halley, in the Philosophical Transactions, n° 216, says, they are the exponents of the ratios of unity to numbers. So, also, Mr. Cotes, in his Harmonia Mensurarum, says, they are the numerical measures of ratios: but all these definitions convey but a very confused notion of logarithms. Mr. Maclaurin, in his Treatise of Fluxions, has explained the natural and genesis of logarithms, agreeably to the notion of their first inventor, lord Naper. Logarithms then, and the quantities to which they correspond, may be supposed to be generated by the motion of a point: and if this point moves over equal spaces in equal times, the line described by it increases equally.

Again, a line decreases proportionably, when the point that moves over it describes such parts in equal times as are always in the same constant ratio to the lines from which they are subducted, or to the distances of that point, at the beginning of those lines, from a given term in that line. In like manner, a line may increase proportionably, if in equal times the moving point describes spaces proportional to its distances from a certain term at the beginning of each time. Thus, in the first case, let *a c* (plate CLX. fig. 2. n° 1 and 2) be to *a o*, *c d* to *c o*, *d e* to *d o*, *e f* to *e o*, *f g* to *f o*, always in the same ratio of Q R to Q S; and suppose the point P sets out from *a*, describing *a c*, *c d*, *d e*, *e f*, *f g*, in equal parts of the time; and let the space described by P in any given time, be always in the same ratio to the distance of P from *o* at the beginning of that time, then will the right line *a o* decrease proportionally.

In like manner, the line *o a*, (*ibid.* n° 3.) increases proportionally, if the point *p*, in equal times, describes spaces *a c*, *c d*, *d e*, *e f*, *f g*, &c. so that *a c* is to *a o*, *c d* to *c o*, *d e* to *d o*, &c. in a constant ratio. If we now suppose a point P describing the line A G (*ibid.* n° 4.) with an uniform motion, while the point *p* describes a line increasing or decreasing proportionally, the line A P, described by P, with this uniform motion, in the same time that *o a*, by increasing or decreasing proportionally, becomes equal to *o p*, is the logarithm of *o p*. Thus A C, A D, A E, &c. are the logarithms of *o c*, *o d*, *o e*, &c. respectively; and *o a* is the quantity whose logarithm is supposed equal to nothing.

We have here abstracted from numbers, that the doctrine may be the more general; but it is plain, that if A C, A D, A E, &c. be supposed, 1, 2, 3, &c. in arithmetic progression; *o c*, *o d*, *o e*, &c. will be in geometric progression; and that the logarithm of *o a*, which may be taken for unity, is nothing.

Lord Naper, in his first scheme of logarithms, supposes, that while *o p* increases or decreases proportionally, the uniform motion of the point P, by which the logarithm of *o p* is generated, is equal to the velocity of *p* at *a*; that is, at the term of time when the logarithms begin to be generated. Hence logarithms, formed after this model, are called Naper's Logarithms, and sometimes Natural Logarithms.

When a ratio is given, the point *p* describes the difference of the terms of the ratio in the same time. When a ratio is duplicate of another ratio, the point *p* describes the difference of the terms in a double time. When a ratio is triplicate of another, it describes the difference of the terms in a triple time; and so on. Also, when a ratio is compounded of two or more ratios, the point *p* describes the difference of the terms of that ratio in a time equal to the sum of the times, in which it describes the differences of the terms of the simple ratios of which it is compounded. And what is here said of the times of the motion of *p* when *o p* increases proportionally, is to be applied to the spaces described by P, in those times, with its uniform motion.

Hence the chief properties of logarithms are deduced. They are the measures of ratios. The excess of the logarithm of the antecedent above the logarithm of the consequent, measures the ratio of those terms. The measure of the ratio of a greater quantity to a lesser is positive; as this ratio, compounded

with any other ratio, increaſes it. The ratio of equality, compounded with any other ratio, neither increaſes nor diminiſhes it; and its meaſure is nothing. The meaſure of the ratio of a leſſer quantity to a greater is negative; as this ratio, compounded with any other ratio, diminiſhes it. The ratio of any quantity A to unity, compounded with the ratio of unity to A, produces the ratio of A to A, or the ratio of equality; and the meaſures of thoſe two ratios deſtroy each other when added together; ſo that when the one is conſidered as poſitive, the other is to be conſidered as negative, By ſuppoſing the logarithms of quantities greater than $o\,a$ (which is ſuppoſed to repreſent unity) to be poſitive, and the logarithms of quantities leſs than it to be negative, the ſame rules ſerve for the operations by logarithms, whether the quantities be greater or leſs than $o\,a$. When $o\,p$ increaſes proportionally, the motion of p is perpetually accelerated; for the ſpaces $a\,c$, $c\,d$, $d\,e$, &c. that are deſcribed by it in any equal times that continually ſucceed after each other, perpetually increaſe in the ſame proportion as the lines $o\,a$, $o\,c$, $o\,d$, &c. When the point p moves from a towards o, and $o\,p$ decreaſes proportionally, the motion of p is perpetually retarded; for the ſpaces deſcribed by it in any equal times that continually ſucceed after each other, decreaſe in this caſe in the ſame proportion as $o\,p$ decreaſes.

If the velocity of the point p be always as the diſtance $o\,p$, then will this line increaſe or decreaſe in the manner ſuppoſed by lord Naper; and the velocity of the point p being the fluxion of the line $o\,p$, will always vary in the ſame ratio as this quantity itſelf. This, we preſume will give a clear idea of the geneſis, or nature of logarithms; but for more of this doctrine, ſee Maclaurin's Fluxions.

Conſtruction of LOGARITHMS. The firſt makers of logarithms, had in this a very laborious and difficult taſk to perform; they firſt made choice of their ſcale or ſyſtem of logarithms, that is, what ſet of arithmetical progreſſionals ſhould anſwer to ſuch a ſet of geometrical ones, for this is entirely arbitrary; and they choſe the decuple geometrical progreſſionals, 1, 10, 100, 1000, 10000, &c. and the arithmetical one, 0, 1, 2, 3, 4, &c. or 0,000000; 1,000000; 2,000000; 3,000000; 4,000000, &c. as the moſt convenient. After this they were to get the logarithms of all the intermediate numbers between 1 and 10, 10 and 100, 100 and 1000, 1000 and 10000, &c. But firſt of all they were to get the logarithms of the prime numbers 3, 5, 7, 11, 13, 17, 19, 23, &c. and when theſe were once had, it was eaſy to get thoſe of the compound numbers made up of the prime ones, by the addition or ſubtraction of their logarithms.

In order to this, they found a mean proportion between 1 and 10, and its logarithm will be $\frac{1}{2}$ that of 10; and ſo given, then they found a mean proportional between the number firſt found and unity, which mean will be nearer to 1 than that before, and its logarithm will be $\frac{1}{2}$ of the former logarithm, of $\frac{1}{4}$ of that of 10; and having in this manner continually found a mean proportional between 1 and the laſt mean, and biſſected the logarithms, they at length, after finding 54 ſuch means, came to a number 1.0000000000000001278191493200323444, ſo near to 1 as not to differ from it ſo much as $\frac{1}{1000000000000000}$ part, and found its logarithm to be

0.0000000000000000555111512312578270,

and

0000000000000001278191493200323[illegible]

to be the difference whereby 1 exceeds the number of roots or mean proportionals found by extraction; and then, by means of theſe numbers, they found the logarithms of any other numbers whatſoever; and that after the following manner: between a given number, whoſe logarithm is wanted, and 1, they found a mean proportional, as above, until at length a number (mixed) be found, ſuch a ſmall matter above 1, as to have 1 and 15 cyphers after it, which are followed by the ſame number of ſignificant figures; then they ſaid, as the laſt number mentioned above is to the mean proportional thus found, ſo is the logarithm above, viz.

0.0000000000000000555111512312578270

to the logarithm of the mean proportional number, ſuch a ſmall matter exceeding 1, as but now mentioned; and this logarithm being as often doubled as the number of mean proportionals (formed to get that number) will be the logarithm of the given number. And this was the method Mr. Briggs took to make the logarithms. But if they are to be made to only ſeven places of figures, which are enough for common uſe, they had only occaſion to find 25 mean proportionals, or, which is the ſame thing

BRITISH MUSEUM

Fig. 1. LIZARDS.

Fig. 2. LOG

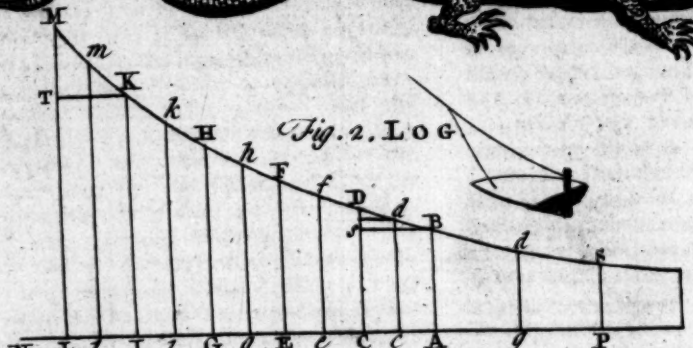


Fig. 3. LOGARITHMIC CURVE.

Fig. 4. LOGARITHMS.

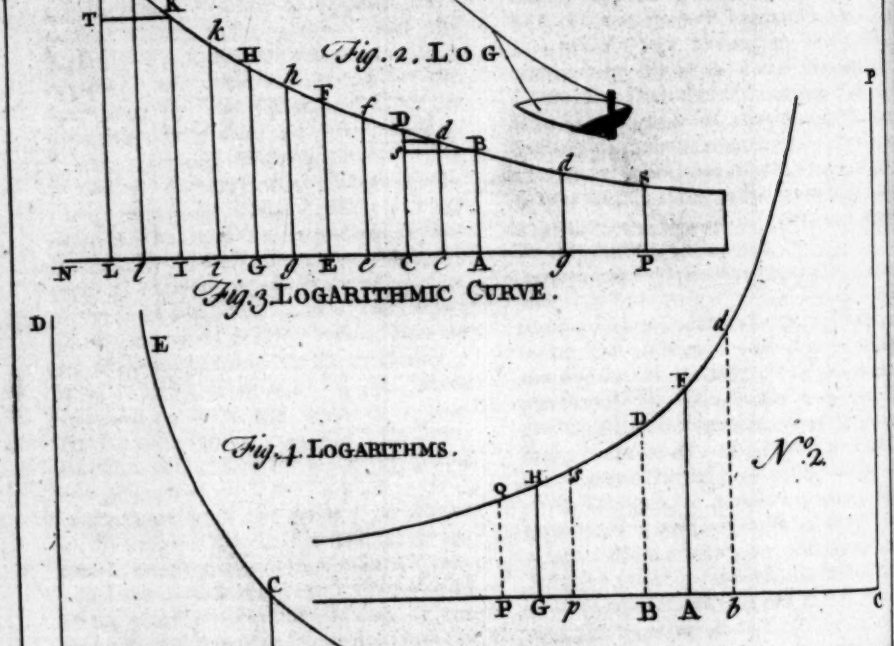


Fig. 5. Knights of St Louis.

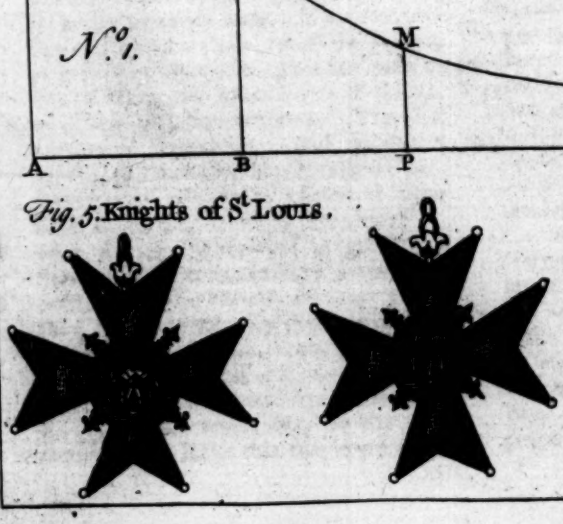


Fig. 6. LOZENGE.

T. Jefferys sculp.

thing, to extract the $\frac{1}{33554432}$th root of 10. Now having the logarithms of 3, 5, and 7, they eaſily got thoſe of 2, 4, 6, 8 and 9; for ſince $\frac{10}{5} = 2$, the logarithm of 2 will be the difference of the logarithms of 10 and 5; the logarithm of 4 will be two times the logarithm of 2; the logarithm of 6 will be the ſum of the logarithm of 2 and 3; and the logarithm of 9 double the logarithm of 3. So, alſo having found the logarithms of 13, 17 and 19, and alſo of 23 and 29, they did eaſily get thoſe of all the numbers between 10 and 30, by addition and ſubtraction only; and ſo having found the logarithms of other prime numbers, they got thoſe of other numbers compounded of them.

But ſince the way above hinted at, for finding the logarithms of the prime numbers is ſo intolerably laborious and troubleſome, the more ſkilful mathematicians that came after the firſt inventors, employing their thoughts about abbreviating this method, had a vaſtly more eaſy and ſhort way offered to them from the contemplation and menſuration of hyperbolic ſpaces contained between the portions of an aſymptote, right lines perpendicular to it, and the curve of the hyperbola: for if E C N (pl. CLXII. fig. 4, n° 1.) be an hyperbola, and A D, A Q the aſymptotes, and A B, A P, A Q, &c. taken upon one of them, be repreſented by numbers, and the ordinates B C, P M, Q N, &c. be drawn from the ſeveral points B, P, Q, &c. to the curve, then will the quadrilinear ſpaces B C M P, P M N Q, &c. *viz.* their numerical meaſures be the logarithms of the quotients of the diviſion of A B by A P, A P by A Q, &c. ſince when A B, A P, A Q, &c. are continual proportionals, the ſaid ſpaces are equal, as is demonſtrated by ſeveral writers concerning conic ſections. See HYPERBOLA.

Having ſaid that theſe hyperbolic ſpaces, numerically expreſſed, may be taken for logarithms, we ſhall next give a ſpecimen, from the great Sir Iſaac Newton, of the method how to meaſure theſe ſpaces, and conſequently of the conſtruction of logarithms.

Let C A (*ibid.* n° 2.) = A F be = 1, and A B = A *b* = *x*; then will $\frac{1}{1+x}$ be = B D, and $\frac{1}{1-x} = b\,d$; and putting theſe expreſſions into ſerieſes, it will be

$\frac{1}{1+x} = 1 - x + x^2 - x^3 + x^4 - x^5$, &c.

and $\frac{1}{1-x} = 1 + x + x^2 + x^3 + x^4 + x^5$, &c.

and $\frac{\dot{x}}{1+x} = \dot{x} - x\dot{x} + x^2\dot{x} - \dot{x}^3\dot{x} + x^4\dot{x} - x^5\dot{x}$, &c. and $\frac{\dot{x}}{1-x} = \dot{x} + x\dot{x} + x^2\dot{x} + x^3\dot{x} + x^4\dot{x} + x^5\dot{x}$, &c. and taking the fluents, we ſhall have the area A F D B $= x - \frac{xx}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \frac{x^5}{5}$, &c. and the area A F *d b*, $= x + \frac{xx}{2} + \frac{x^3}{3} + \frac{x^4}{4} + \frac{x^5}{5}$ &c. and the ſum *b d* D B $= 2x + \frac{2x^3}{3} + \frac{2}{5}x^5 + \frac{2}{7}x^7 + \frac{2}{9}x^9$, &c. Now if A B or *a b* be $\frac{1}{10} = x$, C *b* being = 0.9, and C B = 1.1, by putting this value of *x* in the equations above, we ſhall have the area *b d* D B = 0.2006706954621511 for the terms of the ſeries will ſtand as you ſee in this table,

0.200000000000000	= firſt
6666666666666	= ſecond
40000000000	= third
2857142 86	= fourth
2222222	= fifth
18182	= ſixth
154	= ſeventh
1	= eighth.

Term of the ſeries.

0.2006706954621511

If the parts A *d* and A D of this area be added ſeparately, and the leſſer D A be taken from the greater *d* A, we ſhall have A *d* − AD $= x^2 + \frac{x^4}{2} + \frac{x^6}{3} + \frac{x^8}{4}$, &c. = 0.0100503358535014, for the terms reduced to decimals will ſtand thus:

0.010000000000000	= firſt
500000000000	= ſecond
3333333333	= third
25000000	= fourth
200000	= fifth
1667	= ſixth
14	= ſeventh

Term of the ſeries.

0.0100503358535014.

Now if this difference of the areas be added to, and ſubtracted from their ſum before found, half the aggregate, *viz.* 0.1053605156578263 will be the greater area A *d*. and half the remainder, *viz.* 0.0953101798043249, will be the leſſer area A D.

By the ſame tables, theſe areas A D and A *d*, will be obtained alſo when A B = A *b* are ſuppoſed to be $\frac{1}{100}$ or C B = 1.01, and C *b* = 0.99, if the numbers are but

but duly transferred to lower places, as

0.020000000000000 = 1ſt. } Term
6666666666 = 2d. } of the
400000 = 3d. } ſeries.
28 = 4th.

Sum = 0.020006667066694 = area b D.

0.000100000000000 = firſt } Term
50000000 = ſecond } of the
3333 = third } ſeries.

0.000100000503333 = area Ad—AD.

Half the aggregate 0.010050335853594. = A d, and half the remainder, *viz.* 0.009950330853168 1 = A D.

And ſo putting A B = A b = $\frac{1}{100}$, or C B = 1.001 and C b = 0.999, there will be obtained Ad = 0.001000500033358 35, and A D = 0.000999500133308 35.

After the ſame manner, if A B = A b, be = 0.2, or 0.02, or 0.002, theſe areas will ariſe.

A d = 0.223143551314 2097, and
A D = 0.182321557693 9546, or
A d = 0.020202707317 5194, and
A D = 0.109802627296 1797, or
A d = 0.002002, and A D = 0.001.

From theſe areas, thus found, others may be eaſily had from addition and ſubtraction only. For ſince $\frac{1.2}{0.8} \times \frac{1.2}{0.9} = 2$, the ſum of the areas belonging to the ratios $\frac{1.2}{0.8}$ and $\frac{1.2}{0.9}$, (that is, inſiſting upon the parts of the abſciſs 1.2, 0.8; and 1.2, 0.9) *viz.*

0.405465, &c. and { A D = 0.18232, &c.
A d = 0.10536, &c.

Sum = 0.28768, &c.

added thus, { 0.40546, &c.
0.28768, &c.

Total = 0.69314, &c. = the area of A F H G, when C G is = 2. Alſo ſince $\frac{1.2}{0.8} \times 2 = 3$, the ſum 1.0986122, &c. of the areas belonging to $\frac{1.2}{0.8}$ and 2, will be the area of A F G H, when C G = 3. Again, ſince $\frac{2 \times 2}{0.8} = 5$, and 2 × 3 = 10; by adding A d = 0.2231, &c. AD = 0.1823, &c. and A d = 0.1053, &c. together, their ſum is 0.5108, &c. and this added to 1.0986, &c. the area of A F G H, when C G = 3. You will have 1.6093379124341004 = A F G H, when C G is 5; and adding that of 2 to this, gives 2.3025850929940457 = A F G H, when C G is equal to 10; and ſince 10 × 10 = 100; and 10 × 100 = 1000; and $\sqrt{5 \times 10 \times 0.98} = 7$, and 7 × 1.1 = 11, and $\frac{1000 \times 1.091}{7 \times 11} = 13$, and $\frac{1000 \times 0.998}{2} = 499$; it is plain that the area A F G H may be found by the compoſition of the areas found before, when C G = 100, 1000, or any other of the numbers above mentioned; and all theſe areas are the hyperbolic logarithms of thoſe ſeveral numbers.

Having thus obtained the hyperbolic logarithms of the numbers 10, 0.98, 0.99, 1.01, 1.02; if the logarithms of the ſame laſt of them be divided by the hyperbolic logarithm 2.3025850, &c. of 10, and the index 2, be added; or, which is the ſame thing, if it be multiplied by its reciprocal 0.434294481903251 8, the ratio of the ſubtangent of the logarithmic curve to which Briggs's logarithms are adapted, we ſhall have the true tabular logarithms of 98, 99, 100, 101, 102. Theſe are to be interpolated by ten intervals, and then we ſhall have the logarithms of all the numbers between 980 and 1020, and all between 980 and 1000, being again interpolated by ten intervals, the table will be as it were conſtructed. Then from theſe we are to get the logarithms of all the prime numbers, and their multiples leſs than 100, which may be done by addition and ſubtraction only: for $\frac{\sqrt[10]{84 \times 1020}}{9945} = 2$; $\frac{\sqrt[4]{8 \times 9963}}{984} = 5$; $\frac{\sqrt{98}}{2} = 7$; $\frac{99}{9} = 11$; $\frac{1001}{7 \times 11} = 13$; $\frac{102}{6} = 17$; $\frac{988}{4 \times 13} = 19$; $\frac{9936}{16 \times 27} = 23$; $\frac{986}{2 \times 17} = 29$; $\frac{992}{32} = 31$; $\frac{999}{27} = 37$; $\frac{1025}{25} = 41$; $\frac{989}{23} = 43$; $\frac{987}{21} = 47$; $\frac{9911}{11 \times 17} = 53$; $\frac{9971}{13 \times 13} = 59$; $\frac{9882}{2 \times 81} = 61$; $\frac{9947}{3 \times 23} = 67$; $\frac{994}{14} = 71$; $\frac{9928}{8 \times 17} = 73$; $\frac{9954}{7 \times 18} = 79$; $\frac{996}{12} = 83$; $\frac{9968}{7 \times 16} = 89$; $\frac{9894}{6 \times 17} = 97$.

thus having the logarithms of all the numbers leſs than 100, you have nothing to do but interpolate the ſeveral tables through ten intervals.

Now the void places may be filled up by the following theorem. Let n be a number, whose logarithm is wanted; let x be the difference between that and the two nearest numbers, equally distant on each side, whose logarithms are already found; and let d be half the difference of their logarithms: then the required logarithm of the number n, will be had by adding $\frac{dx}{2n}+\frac{dx^3}{12n^3}$, &c. to the logarithm of the lesser number: for if the numbers are represented by Cp, CG, CP (*ib.* n° 2.) and the ordinates ps, PQ, be raised; if n be wrote for CG, and x for GP, or Gp, the area $psQP$, or $\frac{2x}{n}+\frac{x^3}{2n^2}+\frac{x^3}{3n^3}$, &c. will be to the area $psHG$, as the difference between the logarithms of the extreme numbers, or $2d$, is to the difference between the logarithms of the lesser, and of the middle one; which, therefore, will be

$$\frac{\frac{dx}{n}+\frac{dx^2}{2n}+\frac{dx^3}{3n}, \&c.}{\frac{x}{n}+\frac{x^3}{3n}+\frac{x^5}{5n}, \&c.}=d+\frac{dx}{2n}+\frac{dx^3}{2n^3}, \&c.$$

The two first terms $d+\frac{dx}{2n}$ of this series, being sufficient for the construction of a canon of logarithms, even to 14 places of figures, provided the number, whose logarithm is to be found, be less than 1000; which cannot be very troublesome, because x is either 1 or 2: yet it is not necessary to interpolate all the places by help of this rule, since the logarithms of numbers, which are produced by the multiplication or division of the number last found, may be obtained by the numbers whose logarithms were had before, by the addition or subtraction of their logarithms. Moreover, by the difference of their logarithms, and by their second and third differences, if necessary, the void places may be supplied more expeditiously; the before-going being to be applied only where the continuation of some full places is wanted, in order to obtain these differences.

By the same method rules may be found for the intercalation of logarithms, when three numbers the logarithm of the greater and of the middle number are given, or of the middle number and the greater; and this although the numbers should not be in arithmetical progression. Also by pursuing the steps of this method, rules may be easily discovered for the construction of artificial sines and tangents, without the help of the natural tables. Thus far the great Newton, who says, in one of his letters to Mr. Leibnitz, that he was so much delighted with the construction of logarithms, at his first setting out in those studies, that he was ashamed to tell to how many places of figures he had carried them at that time: and this was before the year 1666; because, he says, the plague made him lay aside those studies, and think of other things.

Dr. Keil, in his Treatise of Logarithms, at the end of his Commandine's Euclid, gives a series, by means of which may be found easily and expeditiously the logarithms of large numbers. Thus, let z be an odd number, whose logarithm is sought: then shall the numbers $z-1$ and $z+1$ be even, and accordingly their logarithms, and the difference of the logarithms will be had, which let be called y. Therefore, also the logarithm of a number, which is a geometrical mean between $z-1$ and $z+1$, will be given, *viz.* equal to half the sum of the logarithms. Now the series $y\times\frac{1}{4z}+\frac{1}{24z^3}+\frac{181}{15120z^7}+\frac{13}{252002^9}$, &c. shall be equal to the logarithm of the ratio, which the geometrical mean between the numbers $z-1$ and $z+1$, has to the arithmetical mean, *viz.* to the number z. If the number exceeds 1000, the first term of the series, *viz.* $\frac{y}{4z}$, is sufficient for producing the logarithm to 13 or 14 places of figures, and the second term will give the logarithm to 20 places of figures. But if z be greater than 10000, the first term will exhibit the logarithm to 18 places of figures: and so this series is of great use in filling up the chiliads omitted by Mr. Briggs. For example, it is required to find the logarithm of 20001: the logarithm of 20000 is the same as the logarithm of 2, with the index 4 prefixed to it; and the difference of the logarithms of 20000 and 20001, is the same as the difference of the logarithms of the numbers 10000 and 10001, *viz.* 0.000043427?, &c. And if this difference be divided by $4z$, or 80004, the quotient $\frac{y}{4z}$ shall be

0.0000000005428133; and if the logarithm of the geometrical mean, *viz.* 4.3010517093024 16 be added to the quotient, the sum will be

4.3010517098452 30 = the logarithm of 20001.

Wherefore it is manifeſt that to have the logarithm to 14 places of figures, there is no neceſſity of continuing out the quotient beyond 6 places of figures. But if you have a mind to have the logarithm to 10 places of figures only, the two firſt figures are enough. And if the logarithms of the numbers above 20000 are to be found by this way, the labour of doing them will moſtly conſiſt in ſetting down the numbers. This ſeries is eaſily deduced from the conſideration of the hyperbolic ſpaces aforeſaid. The firſt figure of every logarithm towards the left hand, which is ſeparated from the reſt by a point, is called the index of that logarithm; becauſe it points out the higheſt or remoteſt place of that number from the place of unity in the infinite ſcale of proportionals towards the left hand: thus, if the index of the logarithm be 1, it ſhews that its higheſt place towards the left hand is the tenth place from unity; and therefore all logarithms which have 1 for their index, will be found between the tenth and hundredth place, in the order of numbers. And for the ſame reaſon all logarithms which have 2 for their index, will be found between the hundredth and thouſandth place, in the order of numbers, *&c.* Whence univerſally the index or characteriſtic of any logarithm is always leſs by one than the number of figures in whole numbers, which anſwer to the given logarithm; and, in decimals, the index is negative.

As all ſyſtems of logarithms whatever, are compoſed of ſimilar quantities, it will be eaſy to form, from any ſyſtem of logarithms, another ſyſtem in any given ratio; and conſequently to reduce one table of logarithms into another of any given form. For as any one logarithm in the given form, is to its correſpondent logarithm in another form; ſo is any other logarithm in the given form, to its correſpondent logarithm in the required form; and hence we may reduce the logarithms of lord Naper into the form of Briggs's, and contrariwiſe. For as 2.302585092, *&c.* lord Naper's logarithm of 10, is to 1.0000000000, Mr. Briggs's logarithm of 10; ſo is any other logarithm in lord Naper's form, to the correſpondent tabular logarithm in Mr. Briggs's form: and becauſe the two firſt numbers conſtantly remain the ſame; if lord Naper's logarithm of any one number be divided by 2.302585, *&c.* or multiplied by 4342944, *&c.* the ratio of 1.0000, *&c.* to 2.30258 *&c.* as is found by dividing 1.00000, *&c.* by 2.30258 *&c.* the quotient in the former, and the product in the latter, will give the correſpondent logarithm in Briggs's form, and the contrary. And, after the ſame manner, the ratio of natural logarithms to that of Briggs's, will be found = 8685889638 06.

The uſe and application of LOGARITHMS.

It is evident, from what has been ſaid of the conſtruction of logarithms, that addition of logarithms muſt be the ſame thing as multiplication in common arithmetic; and ſubtraction in logarithms the ſame as diviſion: therefore, in multiplication by logarithms, add the logarithms of the multiplicand and multiplier together, their ſum is the logarithm of the product.

		num.	logarithm
Example.	Multiplicand	8.5	0.92941
	Multiplier	10	1.00000
	Product	85	1.92941

And in diviſion, ſubtract the logarithm of the diviſor from the logarithm of the dividend, the remainder is the logarithm of the quotient.

		num.	logarithm
Example.	Dividend	9712.8	3.98734
	Diviſor	456	2.65894
	Quotient	21.3	1.32839

To find the complement of a LOGARITHM.

Begin at the left hand, and write down what each figure wants of 9, only what the laſt ſignificant figure wants of 10; the complement of the logarithm of 4, *viz.* 2.6589648, is 7.3410352.

In the rule of three. Add the logarithm of the ſecond and third terms together, and from the ſum ſubtract the logarithm of the firſt, the remainder is the logarithm of the fourth. Or, inſtead of ſubtracting a logarithm, add its complement, and the reſult will be the ſame.

To raiſe powers by LOGARITHMS. Multiply the logarithm of the number given by the index of the power required, the product will be the logarithm of the power ſought.

Example. Let the cube of 32 be required.

ed by logarithms. The logarithm of 32 = 1.5051500, which multiplied by 3, is 4.5154500, the logarithm of 32768, the cube of 32. But in raiſing powers, *viz.* ſquaring, cubing, &c. of any decimal fraction by logarithms, it muſt be obſerved, that the firſt ſignificant figure of the power be put ſo many places below the place of units, as the index of its logarithm wants of 10, 100, &c. multiplied by the index of the power.

To extract the roots of powers by LOGARITHMS. Divide the logarithm of the number by the index of the power, the quotient is the logarithm of the root ſought.

To find mean proportionals between any two numbers. Subtract the logarithm of the leaſt term from the logarithm of the greateſt, and divide the remainder by a number more by one than the number of means deſired; then add the quotient to the logarithm of the leaſt term (or ſubtract it from the logarithm of the greateſt) continually, and it will give the logarithms of all the mean proportionals required.

Example. Let three mean proportionals be ſought, between 106 and 100.

Logarithm of 106 = 2.0253059
Logarithm of 100 = 2.0000000

Divide by 4) 0.0253059 (0.0063264.75

Logarithm of the leaſt term 100 added		2.0000000
Logarithm of the firſt mean	101.4673846	2.0063264.75
Logarithm of the ſecond mean	102.9563014	2.0126529.5
Logarithm of the third mean	104.4670483	2.0189794.25
Logarithm of the greateſt term	106	2.0253059.

LOGIC, λογικη, the art of thinking and reaſoning juſtly; or, it may be defined the ſcience or hiſtory of the human mind, inaſmuch as it traces the progreſs of our knowledge from our firſt and moſt ſimple through all their different combinations, conceptions, and all thoſe numerous deductions that reſult from variouſly comparing them one with another. See the articles IDEA and KNOWLEDGE.

The preciſe buſineſs of logic, therefore, is to explain the nature of the human mind, and the proper manner of conducting its ſeveral powers, in order to the attainment of truth and knowledge. It lays open thoſe errors and miſtakes we are apt, through inattention, to run into; and teaches us how to diſtinguiſh between truth, and what only carries the appearance of it. By this means we grow acquainted with the nature and force of the underſtanding; ſee what things lie within its reach; where we may attain certainty and demonſtration; and when we muſt be contented with probability.

Theſe conſiderations ſufficiently evince the uſefulneſs of this ſcience, which is divided into four parts, according to the number of the operations of the mind in its ſearch after knowledge, *viz.* perception, judgment, reaſoning, and method. See the articles PERCEPTION, &c.

This valuable art of ranging our ideas, connecting them cloſely together, and conſequently of facilitating the tranſition from one to another, ſupplies us with a means of rendering all mens abilities nearly equal. In fact, all our knowledge is reducible to primitive ſenſations, which is nearly alike in all men. The art of combining and connecting our direct ideas only gives them a more or leſs exact arrangement and denomination; whence they become more or leſs ſenſible to others. A man who readily combines his ideas, differs but little from him who combines them ſlowly; as he who judges of a picture at ſight, differs but little from him who requires to be made ſenſible of all its parts: both at the firſt glance have the ſame ſenſations, though they ſink not ſo deep in the ſecond, who therefore dwells longer upon each, to render them ſtrong and diſtinct; and by this means, the reflex ideas of the firſt obſerver become as eaſy to the ſecond as direct ones. And hence, perhaps, there is ſcarce an art or ſcience that may not, by means of a well adapted logic, be taught to a ſlow underſtanding; becauſe there are few arts or ſciences, whoſe precepts or rules may not be reduced to ſimple notions, and diſpoſed in ſo connected an order, that the chain need never be broken. As the mind is more or leſs ſlow in its operations, it requires more or leſs of this connected order. The advantage of a genius is that of having leſs occaſion for it; or rather, of being able to form it quick and almoſt imperceptibly. See the article DEMONSTRATION.

LOGISTIC CURVE, the ſame with that otherwiſe called logarithmic. See the article LOGARITHMIC.

LOGISTIC SPIRAL. See the articles LOGARITHMIC and SPIRAL.

LOGISTICA NUMERALIS, the ſame with algorithm. See ALGORITHM.

LOGISTICAL ARITHMETIC, the doctrine of ſexageſimal fractions. See the article SEXAGESIMALS.

LOGOGRIPH, λογογρίφος, a kind of riddle, which conſiſts in ſome alluſion, or mutilation of words; and is of a middle nature between an ænigma and rebus. See the articles ÆNIGMA and REBUS.

Some alſo give the appellation logogriphs to canting arms. See the article ARMS.

LOHOCH, or LOCH, in pharmacy, a compoſition of a middle conſiſtence between a ſoft electuary and a ſyrup, principally uſed in diſorders of the lungs.

There are ſeveral kinds of lohochs, denominated from the principal ingredient that enters into their compoſition. 1. The common lohoch is made thus: take of freſh-drawn oil of ſweet almonds, and of pectoral or balſamic ſyrup, one ounce; white-ſugar, two drams: mix, and make them into a lohoch. 2. Lohoch of gum tragacanth is made thus: take of the powder of gum tragacanth, two drams; japan-earth, one dram; whites of eggs beat into a fluid, one ounce; ſyrup of meconium, two ounces: mix, as before. 3. Lohoch of linſeed oil is made thus: take of freſh-drawn linſeed-oil, and balſamic ſyrup, each one ounce; flowers of ſulphur, and white-ſugar, each two drams: mix them. 4. Lohoch of manna, thus made: take of calabrian-manna, freſh-drawn oil of ſweet-almonds, and ſyrup of violets, each equal quantities: mix them. 5. Lohoch of ſperma ceti, is made thus: take two drams of ſperma ceti, rub it together with as much yolk of eggs, as will fit it to mix with half an ounce of freſh-drawn oil of almonds, and one ounce of balſamic ſyrup, into the conſiſtence of a lohoch.

LOINS, *lumbi*, in anatomy, the two lateral parts of the umbilical region of the abdomen. See the article ABDOMEN.

LOIRE, the largeſt river in France, riſes in the mountains of the Cevennes, and, after running a courſe of about five hundred miles, falls into the bay of Biſcay.

LOLIUM, DARNEL, in botany, a genus of the triandria digynia claſs of plants, the corolla whereof conſiſts of two valves, the lower is narrow, lanceolated, convoluted, acuminated, and of the length of the cup; the other is ſhort, linear, obtuſe, and hollowed upwards; there is no pericarpium, the corolla incloſes the ſeed, which is ſingle, oblong, compreſſed, convex on one ſide, and plane and ſulcated in the middle on the other.

The ſeed of this plant is reckoned attenuant, abſtergent, drying and heating.

LOMBARDY, a kingdom which comprehended almoſt all Italy. It was erected by the Longobards, or Lombards, a german nation, about the year 598, and laſted till Charlemain put an end to it, about the year 760.

LOMMOND, a lake in the county of Lenox, in Scotland, which runs almoſt the whole length of the county.

LOMWIA, in zoology, the name of a web-footed water-fowl, common on the engliſh ſhores, about the ſize of a common duck.

LONCHITIS, SPLEENWORT, in botany, a genus of the cryptogamia-filicum claſs of plants, the fructifications of which are arranged into lunulated ſeries, and diſpoſed ſeparately under the ſinuſes of the leaves.

The leaves of this plant are of uſe in healing wounds, and in preventing inflammations of them; they are alſo uſed againſt the ſpleen; the root is aperient and diuretic.

LONDON, the metropolis of Great Britain, where the firſt meridian is fixed on the britiſh maps, lies in 51° 32′ north lat. on the river Thames, and the greateſt part on the north ſide of that river. The form of London, including Weſtminſter and Southwark, comes pretty near an oblong ſquare, five miles in length, if meaſured in a direct line from Hyde-Park to the end of Limehouſe, and ſix miles, if we follow the windings of the ſtreets; the greateſt breadth is two miles and a half, and the circumference of the whole ſixteen or ſeventeen miles, but it is not eaſy to meaſure it exactly, on account of its irregular form. The principal ſtreets are generally level, exceeding well built, and extended to a very great length; theſe are inhabited by tradeſmen, whoſe houſes and ſhops make a much better figure than thoſe of any tradeſmen in Europe. People of diſtinction uſually reſide in elegant ſquares, of which there are great numbers at the weſt end of the town near the court. What moſtly contributes to the riches and glory of this city, is the port, whither ſeveral thouſand ſhips of burden annually reſort from all countries, and where the greateſt fleets never fail to meet with wealthy merchan-

merchants ready to take off the richeſt cargoes. The number of perſons in the whole place are computed to be about eight hundred thouſand.

LONDONDERRY, a city of Ireland, in the province of Ulſter, and county of Londonderry, ſituated on the river Mourn, near its mouth, in weſt long. 7° 40′, north lat. 54° 52′.

LONG, an epithet given to whatever exceeds the uſual ſtandard of length: thus, we ſay, a long-boat, long accent, *&c.*

LONGÆVITY, length of life. See AGE. Lord Bacon obſerves, that the ſucceſſion of ages, and of the generation of men, ſeems no way to ſhorten the length of human life, ſince the age of man, down from Moſes's time to the preſent, has ſtood at about eighty years, without gradually declining, as one might have expected; but doubtleſs there are times wherein men live to a longer or ſhorter age, in every country; and they generally prove longeſt-lived, whoſe times afford but a ſimple diet, and give greater occaſion to bodily exerciſe; and ſhorteſt lived, whoſe times are more polite, or abound in luxury and eaſe; but theſe things have their changes and revolutions, whilſt the ſucceſſion of mankind holds one uninterrupted in its courſe: and no queſtion but the ſame is the caſe in other animals, as neither oxen, horſes, ſheep, *&c.* have had their term of life ſhortened in the latter ages, and therefore the lives of creatures were at once abridged by the deluge, and the like may happen from other grand accidents, as particular inundations, long continued droughts, earthquakes, *&c.* The ſame author obſerves, that the inhabitants of cold, northern countries are generally longer lived than thoſe of the ſouthern regions; that high ſituations are more conducive to long life than low ones; and that the particular countries remarkable for long-lived inhabitants are, Arcadia, Ætolia, hither India, Braſil, Ceylon, Britain, Ireland, the Orkneys, and the weſtern Iſlands. The greateſt inſtances of longævity in theſe our iſlands, are that of old Parr, who lived almoſt 153 years; of Jenkins, of Yorkſhire, who lived 169 years; or of the counteſs Deſmond, or Mr. Eckleſton, both of Ireland, who each exceeded 140 years.

LONGFORD, a county of Ireland, in the province of Leinſter, bounded by the county of Letrim and Cavan on the north, by Meath on the eaſt and ſouth, and by Roſcommon on the weſt.

LONG-ISLAND, an iſland belonging to New-York in North America, lying between 71° and 74° weſt long. and in 41° 30′ north lat.

It is ſeparated by a narrow channel from the continent of New-York and Connecticut, and contains three counties, *viz.* Queen's County, Suffolk County, and Richmond County.

LONGIMETRY, the art of meaſuring lengths, both acceſſible, as roads, *&c.* and inacceſſible, as arms of the ſea, *&c.* See MEASURING, DISTANCE, CHAIN, THEODOLITE, CIRCUMFERENTOR, *&c.*

LONGINICO, a town of the Morea, in Europe, ſituated on the river Alpheus, fifty miles ſouth of Lepanto; being the antient Olympia, where Hercules inſtituted the Olympic games. See the article OLYMPIC GAMES.

LONGISSIMUS DORSI, in anatomy, a very complex, long and narrow muſcle, ſituated between the ſpinal apophyſes and the ſacro-lumbaris, from which it is divided by a fatty or cellular line; but, at the lower part, they are confounded together. It covers the ſemiſpinalis or tranſverſo-ſpinalis dorſi, and ſemi-ſpinalis lumborum. Its upper part lies between the ſacro-lumbaris and tranſverſalis colli. This muſcle, and the ſacrolumbaris are common to the back and loins. The longiſſimus dorſi is an aſſiſtant to the ſacro-lumbaris, eſpecially to its vertebral portion, which it helps very powerfully both by the multiplicity and inſertions of its fibres, in ſuſtaining the vertebræ of the back and loins, while extended, whether in ſitting or ſtanding, and in preventing their ſinking under the weight of the body, or any additional burden. It aſſiſts in performing, or counterbalancing all the motions and inflections which theſe vertebræ, eſpecially thoſe of the loins, are capable of in all poſtures of the body. And in this, it alſo bears ſome reſemblance to the inferior or vertebral portion of the ſplenius. And theſe two muſcles on each ſide, and the ſacro lumbares, are of the number of thoſe called vertebrales obliqui divergentes.

LONGISSIMUS OCULI. See OBLIQUUS.

LONGITUDE *of a ſtar*, in aſtronomy, an arch of the ecliptic, intercepted between the beginning of aries, and the point of the ecliptic cut by the ſtar's circle of longitude. See the article CIRCLE, *&c.*

LONGITUDE *of a place*, in geography, is an arch of the equator intercepted between the firſt meridian, and the meridian paſſing through the propoſed place; which

is always equal to the angle at the pole, formed by the first meridian, and the meridian of the place.

The first meridian may be placed at pleasure, passing through any place, as London, Paris, Teneriff, &c. but among us, is generally fixed at London: and the longitudes counted from it will be either east or west, according as they lie on the east or west side of that meridian.

The difference of longitude between two places upon the earth is an arch of the equator comprehended between the two meridians of these places; and the greatest possible is 180°, when the two places lie on opposite meridians.

Since the parallels of latitude always decrease, the nearer they approach the pole; it is plain, a degree upon any of them must be less than a degree upon the equator, in the ratio of the co-sine of the latitude to the radius. Hence, as the radius is to the co-sine of any latitude; so is the minutes of difference of longitude between two meridians, or their difference in miles upon the equator, to the distance of these two meridians on the parallel of that latitude, in miles. And, by this theorem, is the following table constructed.

A Table, shewing how many miles answer to a degree of longitude, at every degree of latitude.

D.L.	Miles	D.L.	Miles	D.L.	Miles	D.L.	Miles
1	59 99	24	54 81	47	40.92	69	21.50
2	59.97	25	54.38	48	40.15	70	20.52
3	59.92	26	53.93	49	39.36	71	19.54
4	59.86	27	53 46	50	38.57	72	18.55
5	59.77	28	52.97	51	37.76	73	17.54
6	59.67	29	52.47	52	36 94	74	16.53
7	59.56	30	51.96	53	36.11	75	15.52
8	59.42	31	51.43	54	35.27	76	14.51
9	59.26	32	50.8	55	34.41	77	13.50
10	59.08	33	50.32	56	33.55	78	12.48
11	58.89	34	49.74	57	32.68	79	11.45
12	58.68	35	49.15	58	31.79	80	10.42
13	58.46	36	48.54	59	30.90	81	9.38
14	58.22	37	47.92	60	30.00	82	8.35
15	57.95	38	47.28	61	29.09	83	7.32
16	57.67	39	46.62	62	28.17	84	6.28
17	57.37	40	45 95	63	27.24	85	5.23
18	57.06	41	45.28	64	26.30	86	4.18
19	56.73	42	44.59	65	25.36	87	3.14
20	56.38	43	43.88	66	24.41	88	2.09
21	56.01	44	43.16	67	23.44	89	1.05
22	55.63	45	42.43	68	22.48	90	0.00
23	55.23	46	41.68				

LONGITUDE, in navigation, the distance of a ship or place, east or west, from another, reckoned in degrees of the equator.

As the discovery of a method to find the longitude would render voyages safe and expeditious, and also preserve ships and the lives of men, the following rewards have been offered by act of parliament, as an encouragement to any person who shall discover a proper method for finding it out: the author or authors of any such method, shall be entitled to the sum of 10,000 l. if it determines the longitude to one degree of a great circle; to 15,000 l. if it determines the same to two-thirds of that distance; and to 20,000 l. if it determines the same to one-half of the same distance; and that half of the reward shall be due and paid when the commissioners of the navy, or the major part of them, agree that any such method extends to the security of ships within eighty geographical miles of the shores, which are places of the greatest danger; and the other half, when a ship, by the appointment of the said commissioners, or the major part of them, shall thereby actually sail over the ocean, from Great Britain to any such port in the West-Indies, as those commissioners, or the major part of them, shall choose for the experiment, without losing their longitude beyond the limits before-mentioned. The French, Dutch, Spaniards, and other nations, have likewise offered rewards for the same purpose.

Since by the motion of the earth round its axis, every point upon its surface describes the circumference of a circle, or 360°, in twenty-four hours time, it is plain it must describe 15° in one hour, because $\frac{360}{24} = 15$. Hence the difference of longitude may be converted into time, by allowing one hour for every fifteen degrees, and proportionally for minutes: also difference of time may be converted into difference of longitude, by allowing fifteen degrees for every hour, and proportionally for a greater or less time. Consequently by knowing the one, we can easily find the other.

Whatever contrivance, therefore, shews the hours of the day, at the same absolute point of time, in two different places, likewise serves to find the difference of longitude between those places. Now since an eclipse of the moon proceeds from nothing else but an interposition of the earth between her and the sun, by which means she is prevented from

from reflecting the light ſhe would otherwiſe receive from the ſun, the moment that any part of her body begins to be deprived of the ſolar rays, it is viſible to all thoſe people who can ſee her at the ſame time; whence if two or more different people, at two or more different places, obſerve the times when it firſt began or ended, or note the time when any number of digits was eclipſed, or when the ſhadow begins to cover or quit any remarkable ſpot, the difference of thoſe times (if there be any) when compared together, will give the difference of longitude between the places of obſervation.

The longitudes of places may alſo be determined from the obſervations of ſolar eclipſes, but theſe being incumbered with the conſiderations of parallaxes, are not near ſo proper as thoſe of the moon are; and each of theſe happening but rarely, another excellent expedient has been thought of, and that is the eclipſes of jupiter's ſatellites. See JUPITER.

Now as neither jupiter nor any of his attendants have any native light of their own, but ſhine with a borrowed light from the ſun, it happens that each of theſe, in every revolution about jupiter, ſuffers two eclipſes, one at their entrance into the ſhadow, the other at the entrance of their paſſage behind his body; whence in each revolution of the ſatellite there are four remarkable appearances, by the obſervation of any one of which the buſineſs may be done, *viz.* one at the entrance into the ſhadow, and one at the immerſion out of it; one at the entrance behind the body, and another at the coming out; but the latter of theſe, *viz.* the ingreſs and egreſs of the ſatellite, into and from under the body, is not ſo much regarded by aſtronomers as the immerſion into and out of the ſhadow, becauſe, in the former, the difficulty of pronouncing the exact time is very great, requiring, in each obſerver, eyes equally good and ſtrong, and teleſcopes equally large; but the obſervation of the former of theſe, *viz.* the immerſion into, and emerſion out of the ſhadow, is eaſy and practicable, becauſe the quick motions of the ſattellites plunge them ſo quick into the ſhadow of jupiter, that it is no difficult matter to pronounce, by any teleſcope by which they may be ſeen, the exact time of their immerſion and emerſion, as any one may ſoon be ſatisfied, if he will but try the experiment.

Now, inaſmuch as each of theſe happens at the ſame moment of abſolute time, if two or more perſons, in different places, note the time of obſervation, theſe, when compared together, will give the difference of longitude between the two places of obſervation. And, when we conſider the great number of theſe eclipſes that happen every year, there being more viſible in one year than there are days in it, and, conſequently, but few nights when jupiter may be ſeen, (and which is near eleven months of the year) but that an eclipſe of one or other happens, and ſometimes two or three in a night; the eaſineſs with which they may be made, there requiring only a teleſcope of eight or ten feet in length, which may be almoſt managed with the hand; and the little likelihood there is of miſſing the times of ingreſs or egreſs, they being in a manner momentaneous; and laſtly, the great exactneſs to which they would give the difference of longitude, it being certainly as exact as the latitude can at preſent be taken; it is much to be wondered at, that the more ſkilful part of our ſeamen have ſo long neglected them, and eſpecially in the ſeveral ports into which they ſail.

Beſides theſe, there is another method equally uſeful, expeditious, and certain; and that is, the appulſes of the moon to certain fixed ſtars, and their occultations by the interpoſition of her body; for, the moon finiſhing her revolution in the ſpace of twenty-ſeven days, ſeven hours, forty-three minutes, there are but few clear nights, when the moon does not paſs over or ſo near to ſome fixed ſtar, that her diſtance from it, or the time of her viſible conjunction with it, may be eaſily obſerved by the teleſcope, and micrometer only; and theſe when compared together, or with the viſible time computed to the meridian of ſome place when a good theory of the moon ſhall be obtained, will ſhew the difference of longitude of thoſe places.

Mr. Flamſtead has given us the places of near 1000 fixed ſtars, confirmed by ſeveral obſervations, that lie within the zodiac, each of which will be covered by the moon and the reſt of the planets, in one revolution of their node; ſo that ſcarce one night can happen but ſome or other of them will be eclipſed, or approached ſo near unto, as to come within the compaſs of a teleſcope, in one place of the earth or other: add to theſe the eclipſes of jupiter's ſatellites, and it is

ſcarce

ſcarce poſſible that any clear night can happen, but the heavens afford us ſome agreeable phænomenon or other, by which the longitude of any place may be duly aſcertained.

In the Philoſophical Tranſactions, n° 1, we have an account of a ſucceſsful experiment made with two pendulum-watches by major Holmes, in a voyage from the coaſt of Guinea homewards. This and ſome other ſucceſſes encouraged monſieur Huygens ſo far, that, after he had improved the ſtructure of theſe watches, he publiſhed an account at large for the ſhewing how and in what manner theſe watches are to be uſed in finding the longitude at ſea, with directions for adjuſting of them and keeping a journal by them; which account the curious reader may ſee at large in the Philoſophical Tranſactions, n° 47.

The chief objection againſt pendulum-clocks and watches, is the effects that heat and cold have upon the ſpring and pendulum, which makes the ſpring in watches draw ſtronger at ſome times than at other times, and cauſes the pendulum to lengthen and ſhorten, according as the weather is hotter or colder; but theſe effects are ſo regular, that without doubt they may be accounted for. See the article PENDULUM.

But the moſt ingenious and ſucceſsful machines for this purpoſe have been invented by Mr. John Harriſon, who, at different times, contrived three different time-pieces for determining the longitude at ſea.

The firſt of Mr. Harriſon's machines was tried in May, 1736, when it was put on board a man of war, and by its exact meaſure of time, in its return from Liſbon, corrected an error of almoſt a degree and an half in the computations of the reckoning of a ſhip. In 1739, Mr. Harriſon finiſhed his ſecond machine, which, from various experiments made upon it, was ſufficiently regular and exact, for finding the longitude of a ſhip within the neareſt limits propoſed by parliament. Upon the ſucceſs of this, Mr. Harriſon, in 1741, undertook a ſtill more advantageous machine, which he finiſhed in 1758, when he applied to the commiſſioners of longitude, for orders to make a trial of that inſtrument to ſome part in the Weſt Indies, as directed by the ſtatutes for the diſcovery of the longitude at ſea. In conſequence of this application, Mr. Harriſon received orders for his ſon to proceed from Portſmouth to Jamaica, in one of his majeſty's ſhips of war, with his third inſtrument, in November 1761; and the commiſſioners having directed that every requiſite ſtep and precaution ſhould be taken, for making, with care, the proper experiments, and aſcertaining their accuracy, not only going to Jamaica, but in the return, it appears, from the calculations made from the experiments in going to Jamaica, that the difference between the longitude, as found by the time-piece, and calculated by the obſervations of the tranſit of mercury in 1743 at Jamaica and London, is five ſeconds of time, which, at Jamaica is little more than a geographical mile.

During the voyage, Mr. Harriſon's time-piece corrected the ſhip's reckoning, which ſometimes erred about a degree and a half: and in going from Madeira to Jamaica, it alſo corrected the errors of the log, and ſhewed the longitude ſo exactly, that the ſhip made the iſland of Deſeada, and all the other iſlands, until they arrived at Jamaica, as foretold by the time-piece. At the arrival at Jamaica the obſervations for finding the time were made by equal altitudes; and the longitude ſhewn by the time-piece, being within 5″ of time of the longitude ſhewn by the moſt accurate obſervations of mercury in its tranſit over the ſun, in the year 1743, and with which all the obſervations at London and Paris, agreeing within 23″, amounts to a demonſtration, that Mr. Harriſon has performed all that is required by the ſtatute of the 12th of queen Anne, to entitle him to the greateſt reward mentioned in that act. In returning from Jamaica, the weather was very tempeſtuous, ſo that the time-piece was forced to be placed on the coldeſt, to avoid being perpetually expoſed to the ſea-water, there it ſuffered continual violent agitations, which, though they neceſſarily retarded its motion, yet did not occaſion any ſuch conſiderable error, as would have made Mr. Harriſon's right to the greateſt reward queſtionable, had it depended on this voyage only, for the time-keeper, in its going and return, loſt only 1′ 54″ and which, in the latitude of Portſmouth amounts to about eighteen geographic miles, or minutes of a great circle, whereas the act required only that

ſhould come within the diſtance of thirty geographical miles or minutes of a great circle.

Some alſo propoſe a method of finding the longitude, by means of a dipping needle. See the article NEEDLE.

For the method of correcting the longitude found by the dead reckoning, ſee the article RECKONING.

rument of LONGITUDE. See the article ARGUMENT.

NGITUDE *of motion*, according to ſome philoſophers, is the diſtance which the center of any moving body runs through, as it moves on in a right line. See the article MOTION.

NGITUDINAL, in general, denotes omething placed lengthwiſe: thus ſome of the fibres of the veſſels in the human body are placed longitudinally, others tranſverſely, or acroſs.

NGUEVILLE, a town of Normandy, n France, twenty miles north of Rouen: aſt long. 1° 10′, north lat. 49° 50′.

NGUS, LONG, an epithet given by natomiſts to ſeveral muſcles to diſtinguiſh them from others of the ſame ame, which are called breves or ſhort; us there is the longus cubiti, which riſes from the inferior coſta of the ſcaula: the longus colli, which ariſes from e bodies of the five upper vertebræ of e back, and is inſerted into all the verbræ of the neck; the longus radii, hich has its origin from the exterior ine of the humerus, and its termination the lower end of the radius. See the ticle MUSCLE.

NGWY, a town in the dutchy of Lorin, ten miles ſouth-weſt of Luxemrg: eaſt long. 5° 25′, north lat. 49° 38′.

NICERA, HONEY-SUCKLE, in botany, genus of the pentandria-monogynia aſs of plants, the corolla whereof conſts of a ſingle petal, the tube is oblong d gibboſe downwards; the limb is diided into five ſegments, one of which is ore deeply ſerrated than the reſt: the uit is a roundiſh umbilicated berry, ntaining two cells; the ſeeds are roundand compreſſed.

NSDALE, a market-town of Weſtoreland, 25 miles ſouth of Appleby.

, a town of Guelderland in the United rovinces, eight miles weſt of Deventer.

, or LANTER-LOO, a game at cards. e the article LANTER-LOO.

OF, in the ſea-language, is a term uſed various ſenſes; thus the loof of a ſhip that part of her aloft, which lies juſt before the cheſt-tree; hence the guns which lie there are called loof-pieces: keep your loof, ſignifies, keep the ſhip near to the wind; to loof into a harbour, is to ſail into it cloſe by the wind: loof up, is to keep nearer the wind: to ſpring the loof, is when a ſhip that was going large before the wind, is brought cloſe by the wind.

LOOF-TACKLE, is a tackle in a ſhip which ſerves to lift goods or ſmall weight in or out of her.

LOOKING-GLASSES, are nothing but plane mirrours of glaſs; which being impervious to the light, reflect the images of things placed before them; for the theory whereof ſee the articles MIRROUR and REFLECTION.

For the caſting, grinding, and poliſhing of looking glaſſes, ſee the article GLASS.

For foliating of looking-glaſſes, ſee the article FOLIATING.

LOOM, a frame compoſed of a variety of parts, uſed in all the branches of weaving; for a particular deſcription of which, ſee the article WEAVING.

LOOM, in the ſea-language: when a ſhip appears big, when ſeen at a diſtance, they ſay ſhe looms.

LOOM-GALE, a gentle eaſy gale of wind, in which a ſhip can carry her top ſails a-trip.

LOON, in ornithology, the engliſh name of ſeveral ſpecies of the colymbus, or diver kind. See the article COLYMBUS.

LOOP, in the iron works, denotes a part of a ſow, or block of caſt iron, broken or melted off from the reſt.

LOOP-HOLES, in a ſhip, are holes made in the coamings of the hatches of a ſhip, and in their bulk-heads, to fire muſkets through, in a cloſe fight.

LOPHIUS, in zoology, a genus of the branchioſtegious order of fiſhes, whoſe head is in ſize equal to all the reſt of the body: the head and body are both of a depreſſed form: there are a number of fleſhy pinnules, or appendages ſurrounding the whole body of the fiſh.

Of this fiſh there is only one genus, commonly known by the name of rana piſcatrix. See the article RANA.

LOPPING, among gardeners, the cutting off the ſide-branches of trees.

It is obſervable, ſays Mr. Miller, that moſt old trees, as aſh, elm, hornbeam, &c. are hollow within, which does not proceed from the nature of the trees, but in their being ſuffered to grow large before they are lopped. The lopping of young

young trees of ten or twelve years old, at moſt, will preſerve them much longer, and will occaſion the ſhoots to grow more into wood in one year, than they do in old tops at two or three. Great boughs ill taken off, are very prejudicial to trees, for which reaſon they ſhould always be taken off cloſe and ſmooth, and not parallel to the horizon; and the wound ſhould be covered with a mixture of loam and horſe-dung, to prevent the wet from entering the body of the tree: however, no trees ſhould be lopped but pollard-trees, for nothing is more injurious to the growth of timber-trees, than lopping off great branches from them. All ſorts of reſinous trees, or ſuch as abound with a milky juice, ſhould be lopped ſparingly; for they are ſubject to decay when often cut. The beſt ſeaſon for lopping theſe trees is ſoon after Bartholomew-tide; at which time they ſeldom bleed much, and the wound is commonly healed over before the cold weather comes on.

LOQUABYR, or LOCHABAR, a part of the county of Inverneſs, in Scotland, ſo called. See the article INVERNESS.

LORA, the name of two towns in Spain, one in the province of Granada, and the other in Andaluſia.

LORA, alſo the name of a town of Germany, in the circle of Upper Saxony, thirty miles north of Saxe-Gotha.

LORANTHUS, in botany, a genus of the hexandria-monogynia claſs of plants; the corolla whereof is formed of a ſingle petal of a ſexangular figure, and divided into ſix nearly equal, linear, revolute ſegments; the fruit is a roundiſh unilocular berry; the ſeeds are ſix, convex on one ſide and angular on the other.

LORCA, a town of Spain, in the province of Murcia, thirty-five miles weſt of Carthagena.

LORD, a title of honour, given to thoſe who are noble, either by birth or creation; in this ſenſe it amounts to much the ſame as peer of the realm, or lord of Parliament. This title is, by the courteſy of England, alſo given to all the ſons of dukes and marquiſes, and to the eldeſt ſons of earls: and it is alſo a title of honour beſtowed on thoſe who are honourable by their employments, as lord advocate, lord chamberlain, lord chancellor, *&c.* See the articles *Lord* ADVOCATE, *Lord* CHAMBERLAIN, *Lord high* CHANCELLOR, *&c.*

Lord in law, is a title given to a perſon who has a fee, and conſequently the homage of tenants within his manor. Theſe lords are divided into lords meſne and lords paramount. See the article HOMAGE, MESNE, and PARAMOUNT.

LOREDO, a town of Italy, in the Poleſine de Rovigo, and territory of Venice, ſituated on the river Adige, twenty miles eaſt of Rovigo.

LORETTO, a city of Italy, in the marquiſate of Ancona, in the pope's territories, 145 miles eaſt of Rome. This place is famous for the chamber of the bleſſed Virgin, which, according to the roman catholic tradition, was brought by angels from Paleſtine to Dalmatia, and from thence tranſported over into Italy, and fixed at Loretto.

LORICATION, COATING, in chemiſtry, is the covering a glaſs or earthen veſſel with a coat or cruſt of a matter able to reſiſt the heat, to prevent its breaking in the performing an operation that requires great violence of fire.

When veſſels are expoſed naked to the greateſt fire, it eaſily happens that they burſt by throwing freſh cold fuel into the fire, for the preventing of which, the operator muſt have recourſe to lorication or coating. This is performed in the following manner: take ſome of the ſame matter of which the muffles and crucibles are made, and inſtead of water moiſten it with freſh blood not yet coagulated, and diluted with twice or thrice the ſame quantity of water, to make a thin paſte of it, then add to this paſte cow's hairs, or other hairs, not very long nor ſtiff, and if you have at hand glaſs pulverized and ſifted, it may alſo be of ſervice to mix ſome of it with the reſt, then with this maſs beſmear your veſſel with a pencil, and dry it; when dried, beſmear it a ſecond time, and dry again; repeat this a third and fourth time, till the veſſel be covered over with a cruſt or coat, one third or fourth part of an inch. See the article CRUCIBLE.

LORN, the north part of Argyleſhire in Scotland, bounded by Lochabar on the north; by Broadalbin on the eaſt; by the reſt of Argyleſhire on the ſouth; and by the ſea on the weſt.

LORRAIN, a dutchy formerly belonging to the circle of the Upper Rhine in Germany, but now united to the crown of France. It is bounded by the dutchy of Luxemburg on the north; by Alſace the dutchy of Deux Ponts, and the

latinate of the Rhine, on the east; by the county of Burgundy, on the south; and by Champaign, on the west.

OT, *sors*, a portion, share, or part of a thing, parcel of goods, or cargo, divided into many; also the condition, chance, or fortune of a person. See the article SORTILEGE.

T and SCOT. See the article SCOT.

T, or LOTH, in mining, the thirteenth dish, measure, or part of the miner's ore, which the bar-master takes up for the king, or the farmer.

THIAN, a county of Scotland, bounded by the firth of Forth on the north; by the German Sea, on the east; by Clydesdale, Tweedale and Merse, on the south; and by Stirling, on the west. The capital of this county is Edinburgh.

TION, *lotio*, in medicine and pharmacy, is, strictly speaking, such washing as concerns beautifying the skin, by cleansing it of those deformities which a distempered blood sometimes throws upon it, or rather are made by a preternatural secretion: for according to Quincy, generally those distempers of the skin commonly accounted signs of a foul blood, are from those salts which are natural in the best constitution, thrown off by the cutaneous glands, which ought to be washed away through the kidneys; so that instead of those insignificant and ridiculous tribes of sweetners, which in this case are frequently used, promoting the urinary discharge, or rectifying that of the skin by proper washes, frictions, or ointments, or both together, is the only way to get rid of such disorders: under this division we shall therefore give such examples of what is proper for this purpose, though many mix herewith such as are more suitable for fomentation. See the article FOMENTATION.

To make a repelling lotion: take litharge of gold, four ounces; white wine vinegar, half a pound; digest them together three days, stirring it often, and then filtre for use. This is proper in bitterous eruptions and pimples, which with heat are apt to break out upon the skin; but it is not to be used in critical breakings out, which are by no means to be drove back, but rather encouraged. See the article ERUPTION.

To make a stronger repelling lotion: take common white vitriol, an ounce; crude alum, two drams; boil them in twelve ounces of spring-water to eight ounces; take off the scum, and put the liquor up for use. This must be boiled in an iron-vessel, because it is so penetrating as to run through any other. It may be diluted with rose-water, so as to make a good collyrium. The use of this is yet more mischievous than the former, if due care be not taken: therefore some other emunctory must be in readiness to discharge what is lessened by the application of this medicine.

To make an oily lotion for smoothing and softening the skin, and deterging or repelling the humours which deform it, but chiefly to cleanse away freckles and morphew: take oil of tartar per deliquium, an ounce; oil of sweet almonds, two drams; rose-water, four ounces, shake them together.

LOTTERY, a kind of public game at hazard, frequent in Britain, France, and Holland, in order to raise money for the service of the state; being appointed with us by the authority of parliament, and managed by commissioners appointed by the lords of the treasury for that purpose. It consists of several numbers of blanks and prizes, which are drawn out of wheels, one of which contains the numbers, and the other the corresponding blanks or prizes. In order to suppress private lotteries, it is ordained that no person shall put up any office for the sale of any house, lands, or goods, *&c.* or expose the same to sale by way of lottery, lots, tickets, or numbers, nor shall they publish any proposal relating thereto under the penalty of 500 l. and likewise the adventurers in such sales shall forfeit double the sum they had contributed. Any person who shall sell or deliver any ticket in any foreign lottery, shall upon conviction of that offence, forfeit 200 l. A yearly sum of £4,000 l. out of the additional duties on stamped vellum, parchment, and paper, shall be a fund for annuities of three per cent. to contributers in a lottery until redemption by parliament, and shall be paid half yearly at Christmas and Midsummer to the cashier of the bank. See the articles CHANCE, GAMING, *&c.*

LOTUS, the SQUARE-PODDED VETCH, in botany, a genus of the diadelphia-decandria class of plants, the corolla whereof is papilionaceous, the vexillum is roundish, and bent back, with an oblong concave unguis; the alæ are roundish, and shorter than the vexillum; the carina is gibbous underneath, and shut above: the fruit is a cylindric pod, consisting

ſiſting of two valves, and containing two cells: the ſeeds are numerous and roundiſh.

LOVAGE, in botany, the engliſh name for the liguſticum. See LIGUSTICUM.

LOUDAN, a town of France, in the province of Orleanois, and territory of Poictou, ſituated twenty-five miles north of Poictiers.

LOVE APPLE, the fruit of a ſpecies of ſolanum, a plant cultivated in gardens among us for the ſingularity of its appearance: the Portugueſe eat this fruit either raw or ſtewed, as do alſo the jew-families in England.

LOVENDEGEN, a fortreſs in the Auſtrian Netherlands, in the province of Flanders, ſituated on the canal between Ghent and Bruges, five miles weſt from Ghent.

LOUGHBOROUGH, a market-town in Leiceſterſhire, ſituated ten miles north of Leiceſter.

LOUIS, or *Knights of St.* LOUIS, the name of a military order in France inſtituted by Louis XIV. in 1693. Their collars are of a flame-colour, and paſs from left to right; the king is their grand maſter. There are in it eight great croſſes, and twenty four commanders; the number of knights is not limited. At the time of their inſtitution, the king charged his revenue with a fund of three hundred thouſand livres for the penſions of the commanders and knights. See the croſſes worn by theſe knights, repreſented in plate CLXII. fig. 5.

LOUIS, LEWIS, LOUIS D'OR, or LEWISDORE, a french coin. See COIN.

LOUISIANA, or NEW FRANCE, a country of north America, bounded with the river and lake of Illenois, on the north; North Carolina, on the eaſt, and the gulph of Mexico on the ſouth.

LOUITS, a town of Great Poland, in the palatinate of Rava, ſixty-five miles eaſt of Gneſna.

LOUREBRANDER, a town of hither India, at the mouth of the river Indus, in eaſt long. 67°, north lat. 25°.

LOUSE, *pediculus*, in zoology. See the article PEDICULUS.

LOUTH, a county of Ireland, in the province of Leinſter, bounded by Monaghan and Armagh on the north; by the Iriſh Channel, on the eaſt; by Eaſt Meath, on the ſouth; and by Cavan, on the weſt.

LOUTH, a market-town of Lincolnſhire, twenty-four miles north-eaſt of Lincoln.

LOUVAIN, a city of the Auſtrian Netherlands, in the province of Brabant, ſituated on the river Dyle, fifteen miles north-eaſt of Bruſſels.

LOUVESTEIN, a fortreſs of the United Provinces, ſituated in the province of Holland, at the confluence of the rivers Waal and Maes, ſixteen miles eaſt of Dort.

LOUVO, a city of Siam, in the farther India, ſituated in eaſt long. 101°, north lat. 15°.

LOW-BELLS, or LOW-BELLERS, in our ſtatute-book, are perſons who go in the night-time with a light and a bell, by the ſight and noiſe whereof birds, ſitting on the ground, become ſtupified, and are covered with a net and taken.

LOWERING, among diſtillers, a term uſed to expreſs the debaſing the ſtrength of any ſpirituous liquors, by mixing water with it. The ſtandard and marketable price of theſe liquors is fixed in regard to a certain ſtrength in them called proof; this is that ſtrength which makes them when ſhook in a vial, or poured from on high into a glaſs, retain a ſtable or crown of bubbles for ſome time. In this ſtate, ſpirits conſiſt of about half pure or totally inflammable ſpirit, and half water; and if any foreign or higher ſpirits are to be expoſed to ſale, and are found to have that proof wanting, ſcarce any body will buy it till it has been diſtilled again and brought to the ſtrength; and if it is above that ſtrength the proprietor uſually adds water to it to bring it down to that ſtandard. See the article PROOF.

There is another kind of lowering among the retailers of ſpirituous liquors to the vulgar, by reducing it under the ſtandard-proof: whoever has the art of doing this without deſtroying the bubble proof, which is eaſily done by means of ſome addition that gives a greater tenacity to the parts of the ſpirits, will deceive all that judge by this proof alone. In this caſe, the beſt way to judge of liquors is by the eye and tongue, and eſpecially by the inſtrument called hydrometer. See the article HYDROMETER.

LOXA, a city of Peru, 200 miles eaſt of Payta: weſt long. 77°, ſouth lat. 5°.

LOXIA, in the linnæan ſyſtem of zoology, the name of a genus of birds of the order of the paſſeres; the diſtinguiſhing characters of which are, that the tongue is plain, equal and whole, the beak large, thick, and ſhort, and crooked and convex both ways.

of this genus is the croſs-bill, called in ſome places the ſhell-apple, ſuppoſed to be the tragon of the antients. It is about the ſize of the green-finch, and much of the ſame ſhape. It has a forked tail, and the chaps of its bill are ſo bent, that the points croſs one another; whence the name. See plate CLXIV. fig. 1.

XODROMICS, the art of oblique ſailing. See the article SAILING.

YA, a town of Spain, in the province of Granada, twenty-five miles weſt of the city of Granada.

ZENGE, LOZANGE, *rhombus*, in geometry, a quadrilateral figure, conſiſting of four equal and parallel ſides, two of whoſe oppoſite angles are acute, and the other two obtuſe: the diſtance between the two obtuſe ones being always equal to the length of one ſide; when the ſides are unequal, the figure is called a rhomboides.

ZENGE, in heraldry, a rhombus, or figure of equal ſides, but unequal angles, reſembling a quarry of glaſs in our old windows, placed erect, point-ways. It is in this figure, that all unmarried gentlewomen and widows bear their coats of arms, becauſe, as ſome ſay, it was the figure of the amazonian ſhield; or as others, becauſe it is the antient figure of the ſpindle. Plate CLXII. fig. 6. repreſents an ordinary of lozenges.

The lozenge differs from the fuſil, in that the latter is narrower in the middle, and not ſo ſharp at the ends.

ZENGE, in pharmacy, the ſame with what is otherwiſe call troche. See the article TROCHE.

BAN, a town of Livonia, ſeventy miles eaſt of Riga, ſubject to Ruſſia.

BEC, a city and port-town of Germany, in the circle of Lower Saxony, and dutchy of Holſtein, ſituated ten miles ſouth-weſt of the Baltic ſea: eaſt long. 10° 35′, north lat. 54′ 20′.

BEN, a town of Germany, in the circle of Upper Saxony, and marquiſate of Luſatia: eaſt longitude 14° 25′, north latitude 52°.

BEN, a town of Bohemia, in the province of Sileſia, twenty-two miles north-weſt of Breſlaw.

BLIN, a city of Poland, in the palatinate of the ſame name: eaſt long. 22° 5′, north lat. 51° 30′.

BOW, a town of Poland, in the palatinate of Cracow: eaſt long. 20° 30′, north lat. 49° 30′.

C, a town of Provence, in France, twenty-three miles north-eaſt of Toulon.

LUC, is alſo a town of France, in the province of Dauphine, thirty-two miles ſouth of Grenoble.

LUCAR, or *St.* LUCAR, a port-town of Spain, in the province of Andaluſia: weſt long. 6° 38′, north lat. 36° 42′.

St. LUCAR is alſo a town of Andaluſia, in Spain: weſt longitude 8° 12′, north latitude 37° 20′.

St. LUCAR is alſo the name of another town of Spain, fifteen miles weſt of Seville.

LUCARNO, a town of the dutchy of Milan, ſituated on the lake of Maggiore, but ſubject to Switzerland.

LUCAYA, or BAHAMA-ISLANDS. See the article BAHAMA.

LUCCA, the capital of the republic of the ſame name in Italy, ſituated twelve miles eaſt of the Tuſcan ſea: eaſt longitude 11° 20′, north latitude 43° 45′.

The territory of this ſmall republic is about twenty-five miles long, and twenty broad, and the ordinary revenues of the ſtate about 30,000 l. *per annum*.

LUCERA, a town of Italy, in the kingdom of Naples, and territory of the Capitinate: eaſt longitude 16° 6′, north latitude 41° 20′.

LUCERN, the capital of the canton of the ſame name in Switzerland, ſituated on the lake Lucern, to which it gives its name: eaſt long. 8° 12′, north lat. 47°. It ſtands on a plain almoſt ſurrounded with mountains. The canton itſelf, which is inhabited by papiſts, is about fifty miles long, and thirty broad.

LUCERNA, a town of Italy, in the territory of Piedmont, fifteen miles ſouth of Turin.

LUCERNA, in ichthyology, a name given to a fiſh more commonly known by that of uranoſcopus. See URANOSCOPUS.

LUCERNE, in botany, *&c.* a plant frequently cultivated in the manner of clover, and known among authors by the names of medica and medicago. See the article MEDICAGO.

The leaves of this plant grow three at a joint, like thoſe of clover; its ſtalks are erect, and after mowing, immediately ſpring up again from the ſtubble or cut ſtumps. It is made into hay in the ſame manner as ſaint-foin, but ſhould be mowed before it flowers: it makes the ſweeteſt and moſt fattening food in the world for cattle; but muſt be given with caution, otherwiſe it will cauſe them to ſwell. See the article HAY.

LUCHEN, a town of Spain, in the province

of Valencia, thirty miles ſouth of the city of Valencia.

LUCIA-ISLANDS, one of the Caribbee-iſlands in America, ſituated ſeventy miles north-weſt of Barbadoes, being twenty-two miles long, and eleven broad.

St. LUCIA, one of the Cape Verd iſlands in Africa, lying in weſt long. 25°, north lat. 16° 30′.

LUCID INTERVALS, in lunatics, the times wherein they appear to be in their ſenſes. See the article LUNATIC.

LUCIDA, in aſtronomy, an appellation given to ſeveral fixed ſtars on account of their ſuperior brightneſs; as the lucida coronæ, a ſtar of the ſecond magnitude, in the northern crown; the lucida hydræ, or cor hydræ; and the lucida lyræ, a ſtar of the firſt magnitude, in that conſtellation.

LUCIGNANO, a town of Italy, in the dutchy of Tuſcany, ſituated in eaſt long. 12° 35′, north lat. 43° 10′.

LUCIOPERCA, the PIKE-PEARCH, or BRASSE, in ichthyology, a ſpecies of pearch, with two large teeth on each ſide. It grows frequently to two feet in length; its head is large, and compreſſed; its breaſt flat; and the belly convex, as is the back; and the fins are ſituated as repreſented in plate CLXIII. fig. 1.

LUCIUS, the PIKE, or JACK, in ichthyology, a ſpecies of eſox, with a depreſſed roſtrum. See the article ESOX.

The pike grows to a conſiderable ſize, but uſually is found from fourteen inches to two feet in length: it is all over variegated with round yellowiſh ſpots. It is a well known and very voracious fiſh. See plate CLXIII. fig. 2.

For the method of fiſhing it, ſee the articles FISHING and HUXING.

LUCIUS MARINUS, the name of two fiſhes, otherwiſe called hake and ſphyræna.

LUCON, a town of France, in the territory of Poictou, ſituated fifteen miles north of Rochelle.

LUCONIA, or MANILLA, the chief of the Philippine iſlands, ſituated between 117° and 123° eaſt long. and between 12° and 19° of north lat.

LUDLOW, a borough of Shropſhire, ſituated on the river Corve, eighteen miles ſouth of Shrewſbury. It ſends two members to parliament.

LUDUS HELMONTII, in natural hiſtory, a name given to the ſeptariæ with ſparry partitions. See SEPTARIÆ.

LUDWIGIA, in botany, a genus of the tetrandria-monogynia claſs of plants, the corolla whereof conſiſts of four plane, patent, equal petals, of an obverſely cordated figure: the fruit is a quadragonal obtuſe capſule, ſurrounded with the cup, and coronated with it at the extremity: in conſiſts of four cells, and opens in four places at once: the ſeeds are numerous and ſmall.

LUES, among phyſicians, is, in general, uſed for a diſeaſe of any kind; but, in a more particular ſenſe, is reſtrained to contagious and peſtilential diſeaſes; thus the lues gallica, or venerea, ſignifies the venereal diſeaſe. See the article POX, *&c.*

LUFF, or LOOF, in the ſea language. See the article LOOF.

LUG, a river of Wales, which paſſes by Monmouth, and falls into the Severn at Chepſtow.

LUGANO, a town of Italy, in the dutchy of Milan, ſituated on the lake Lugano, twenty miles north-weſt of Como.

LUGGERSHAL, a borough-town, ten miles north of Saliſbury. It ſends two members to parliament.

LUGO, a city and biſhop's ſee of Spain, ſixty miles eaſt of Compoſtella: weſt long. 7° 50′, and north lat. 43° 5′.

LUKE, or *goſpel of St.* LUKE, a canonical book of the New Teſtament.

Some think it was properly St. Paul's goſpel, and that when that apoſtle ſpeaks of his goſpel, he means what is called St. Luke's. Irenæus ſays, that St. Luke digeſted into writing what St. Paul preached to the gentiles; and Gregory Nazianzen tells us, that St. Luke wrote with the aſſiſtance of St. Paul.

"St. Luke, ſays a modern writer, is pure, copious, and flowing in his language, and has a wonderful and entertaining variety of ſelect circumſtances in his narration of our Saviour's divine actions. He acquaints us with numerous paſſages of the evangelical hiſtory, not related by any other evangeliſt; both in his goſpel and apoſtolical acts, he is accurate and nervous, clear and flowing, with a natural and eaſy grace: his ſtile is admirably accommodated to the deſign of his hiſtory; it had a good deal of reſemblance to that of his great maſter St. Paul; and like him, he had a learned and liberal education. I believe he had been very converſant with the beſt claſſics; for many of his words and expreſſions are exactly parallel to theirs." *Blackwall's Sacred Claſſics*

LUKE *the evangeliſt's day*, a feſtival in the chriſtian church, obſerved on the 18th of October.

ULA, a town of ſwediſh Lapland, ſituated at the mouth of the river of the ſame name, on the weſt ſide of the Bothnic gulph: eaſt longitude 21°, north latitude 64° 30′.

ULA LAPMARK, a province of Sweden, bounded on the north by that of Torne; on the eaſt, by the Bothnic gulph; on the ſouth, by Pithia-lapmark; and on the weſt, by Norway.

UMBAGO, in medicine, denotes a pain about the loins, as that preceding fevers, agues, and rheumatiſm. See the articles FEVER, AGUE, and RHEUMATISM.

UMBARIS, a name given to the arteries and veins which ſpread over the loins; or an epithet to diſtinguiſh thoſe branches of the aorta which carry the blood to the muſcles of the loins, to thoſe of the abdomen, and other of the circumjacent parts, and alſo to certain veins which bring back the blood from the loins into the trunk of the vena cava.

UMBRICAL, a name given to four muſcles of the fingers, and to as many of the toes. They are in each called the flexors of the firſt phalanx; thoſe of the fingers ariſe deep and tendinous, and are inſerted into the firſt phalanges on the ſide next the thumb: thoſe of the toes have their origin from the tendon of the muſculus perforans, and from the interior part of the calcaneum: their termination is at the firſt phalanx of the ſeveral toes.

UMBRICUS, the EARTH-WORM, in zoology. See the article WORMS.

UMME, in ornithology, a ſpecies of colymbus, with palmated undivided feet. See the article COLYMBUS.

This is a very beautiful bird, and is extremely common in ſome particular parts of the north of Europe, though wholly unknown elſewhere: it is about equal to our common wild-duck in ſize; the head is large, and rounded at the ſides, but ſomewhat depreſſed on the crown; the eyes are large, ſharp, and piercing, and their iris of a fine pale hazel; the beak is about an inch and three quarters in length, and towards the baſe pretty thick, and of a deep gloſſy black; as are alſo the legs, which are very robuſt; the head and neck are grey; the back and wings black, but beautifully variegated with ſquare ſpots of white; and the breaſt and belly are white.

LUMP-FISH, *cyclopterus*. See the article CYCLOPTERUS.

LUNA, in aſtronomy, the moon. See the article MOON.

LUNA, among chemiſts, ſignifies ſilver. See the article SILVER.

LUNAR, ſomething belonging to the moon; thus we ſay lunar month, lunar year, lunar dial, lunar eclipſe, &c. See MOON, MONTH, YEAR, &c.

LUNARIA, HONESTY, in botany, a genus of the tetradynamia-ſiliculoſa claſs of plants; the corolla whereof conſiſts of four cruciform, entire, obtuſe, large petals of the length of the cup, and ending in ungues of the ſame length; the fruit conſiſts of an elliptic, plano-compreſſed, erect, and very large pod, ſtanding upon a pedicle, terminated by a ſtyle, conſiſting of two valves, and containing two cells; the ſeeds are few, kidney ſhaped, compreſſed, marginated, and placed in the middle of the pod.

This plant is famous in ſome parts of the kingdom for its medicinal virtues, though it has not the fortune to be received in the ſhops. The people in the northern countries dry the whole plant in the oven, and give as much as will lie on a ſhilling for a doſe, twice a day, in hæmorrhages of all kinds, particularly in the too abundant flowing of the menſes, and this with great ſucceſs. The Welſh, among whom it is not uncommon, Dr. Needham informs us, make an ointment of it, which they uſe externally, and pretend it cures dyſenteries.

LUNATIC, a perſon affected with lunacy, the cure of which is to be attempted by evacuations of all kinds; as bleeding, vomiting, cathartics, &c. See MADNESS.

A lunatic is defined by our lawyers to be a perſon who is ſometimes of a ſound mind, and at other times not ſo; in which laſt caſe, he is ſaid to be *non compos mentis*. A lunatic, while in this ſtate, is not chargeable with any criminal act, except an attempt upon the perſon of the king; and, therefore, where a perſon incites a lunatic to commit a criminal action, he is, in the eye of the law, a principal offender, and is puniſhed in the ſame manner as if he committed it himſelf. But tho' a lunatic is not puniſhable, yet to prevent miſchief, he may be confined in priſon till he has recovered his ſenſes. Lunatics or madmen, that warder about, may be apprehended by a juſtice's warrant, locked up, and chained, if neceſſary; or ſent to their legal ſettlement,

ment, and two juſtices of peace may charge their eſtates for their maintenance. Commiſſions of lunacy are iſſued out of chancery, impowering the commiſſioners to examine whether a perſon be a lunatic, and alſo to make inqueſt of his lands, *&c.* But in ſuch caſe, tho' lands are ſeized by the king upon a commiſſion of lunacy and he grants the cuſtody of the lunatic, *ſine computo reddendo*, that is, without an account to be rendered; yet if the lunatic becomes afterwards of a ſound memory, he may have an action of account for the profits. It is ordained, that the king ſhall provide that the lands of a lunatic be ſafely kept, that he and his family be maintained out of the profits, and the reſidue delivered to him when he comes to his right mind, the king taking nothing to himſelf: any deed or contract made by a lunatic, may be ſet aſide by his next heir, but not by himſelf; yet where a lunatic has purchaſed, if he recover his memory, he may agree to it, after which his heirs cannot diſagree to it.

LUND, or LUNDEN, a city of Sweden, in the province of Gothland, the capital of the territory of Schonen, ſituated thirty miles eaſt of Copenhagen.

LUNDEN, a town of Germany, in the circle of Lower Saxony, and dutchy of Holſtein: eaſt long. 8° 45′, north lat. 54° 45′.

LUNDY, a little iſland in the mouth of the Briſtol-channel: weſt long. 4° 50′, north lat. 51° 25′.

LUNENBURG, the capital of the dutchy of the ſame name, thirty-miles ſouth-eaſt of Hamburg: eaſt long. 10° 20′, north lat. 53° 35′.

LUNGS, a part of the human body, which is the cauſe or inſtrument of reſpiration. The lungs are the largeſt viſcus of the thorax: they are ſituated in the two ſides of it, with the heart as it were between them; and are connected by means of the mediaſtinum, with the ſternum and vertebræ; with the heart, by means of the pulmonary veſſels, and immediately with the aſpera arteria. The colour of the lungs, in infants, is a fine florid red; in adults, it is darker; and in old people, livid, or variegated with black and white. When inflated, they have ſome reſemblance to the hoof of an ox; and are convex on the upper ſide, and concave underneath. They are divided into two large lobes, the right and left; the left, which is the ſmaller, is divided again into two; and the right, which is larger, into three ſmaller ones. The membrane with which the lungs are ſurrounded, is continuous with the pleura. The ſubſtance of the lungs is ſpongeous, or veſiculous, and they ſeem, indeed, entirely compoſed of a number of ſmall veſicles of a fleſhy texture, and of a variety of veſſels. The veſſels of the lungs are the bronchia, the bronchial artery and vein, the pulmonary artery and vein, the nerves, and the lymphatics. See BRONCHIA, *&c.*

The uſes of the lungs are, 1. To perform the office of reſpiration, by which the blood is attenuated in the plexus of the arteries called the rete vaſculoſum. 2. To be aſſiſtant to the voice in ſpeaking, and to the ſenſe of ſmelling. They are alſo emunctories of the blood, and are of many other important ſervices.

To give a more diſtinct idea of the form of the lungs and their ſituation, with reſpect to the parts to which they are united, we have given a plate of them, in which they are repreſented in two different views, ſee plate CLXIV. fig. 2. where, in n° 1. A is the larynx; B, the aſpera arteria, or wind-pipe; CC, the lungs; D, the thymus; EE, two branches of nerves paſſing to, FFF, the diaphragm. In n° 2. A is alſo the larynx; B, the aſpera arteria; CCCCC, the lobes of the lungs; D, the heart incloſed in the pericardium; E, the vena cava ſuperior; F, the ſubclavian and carotid arteries.

For the diſeaſes in the lungs, ſee the articles ASTHMA, CONSUMPTION, PERIPNEUMONY, *&c.*

LUNG-WORT, *pulmonaria*, in botany. See the article PULMONARIA.

LUNISOLAR YEAR, in chronology, the ſpace of 532 common years; found by multiplying the cycle of the ſun by that of the moon. See CYCLE and YEAR.

LUNULA, in geometry, a plane figure like a creſcent, or half-moon, for the quadrature of which, ſee QUADRATURE.

LUPERCALIA, a feſtival of the antient Romans in honour of the god Pan, obſerved on the 15th of February, and called from luperci, the prieſts of that fabulous diety. This feſtival was inſtituted by Evander, who being driven from Arcadia, and received by king Faunus introduced the worſhip of Pan in Italy; but the ceremonies and magnificence of this feaſt were encreaſed by Romulus. At this feſtival the luperci ran naked about the city, ſtriking thoſe they met

with thongs cut out of the ſkins of goats: the women fooliſhly imagined that their receiving the ſacred ſtroke helped conception, and rendered their delivery more eaſy. Cicero, after ſpeaking with contempt of the luperci, in his ſecond Philippic, ridicules Anthony for running about as a lupercus. Nevertheleſs we find that magiſtrates and perſons of noble birth, were not aſhamed to act ſo ridiculous a part in the ſight of all the citizens.

LUPIA, in ſurgery, a kind of encyſted tumour, called alſo talpa and teſtudo. See *Encyſted* TUMOURS.

LUPINE, *lupinus*, in botany, a genus of the diadelphia-decandria claſs of plants, the corolla whereof is papilionaceous; the vexillum is cordated, roundiſh, and emarginated: the alæ are oval, and almoſt of the ſame length with the vexillum; the carina is divided into two ſegments at the baſe: the fruit is a large, oblong, coriaceous, compreſſed, acuminated pod, containing only one cell: the ſeeds are numerous, roundiſh, and compreſſed. See plate CLXIII. fig. 5.

LUPULUS, the HOP, in botany, *&c.* See the article HOP.

LUPUS, the WOLF, in zoology. See the article WOLF.

LUPUS, in ornithology, the ſame with the monedula, or jackdaw. See JACKDAW.

LUPUS MARINUS, the SEA-WOLF, in ichthyology, conſtitutes a diſtinct genus of malacopterygious fiſhes, with a compreſſed body, and ſix or more oſſicles in the membrane of the gills. On the back there is only one fin, which extends almoſt from the head to the tail. It is a very ſingular fiſh, growing to four or five feet long. See plate CLXIII. fig. 3.

This fiſh is called anarrhichas, by the generality of authors.

LUPUS, in aſtronomy, a ſouthern conſtellation, conſiſting of nineteen, or, according to Flamſtead, of twenty-four ſtars.

LURE, in falconry, a device of leather, in the form of a bird, with two wings ſtuck with feathers, and baited with a piece of fleſh; wherewith to reclaim or call back a hawk, when at a conſiderable diſtance. See the article FALCONRY.

LURE, in geography, a town of Champaign, in France, thirty-five miles north-eaſt of Beſançon.

LUSATIA, a marquiſate of Upper Saxony, bounded by Brandenburg, on the north; by Sileſia, on the eaſt; by Bohemia, on the ſouth; and by the dutchy of Saxony, on the weſt: it is ſubject to the king of Poland.

LUSCINIA, the NIGHTINGALE, in ornithology. See NIGHTINGALE.

LUSIGNAN, a town of France, fifteen miles ſouth-weſt of Poictiers, ſituated under the meridian of London.

LUST, in the ſea-language. When a ſhip heels more one way than another, ſhe is ſaid to have a luſt that way.

LUSTRATION, in antiquity, ſacrifices or ceremonies by which the antients purified their cities, fields, armies, or people, defiled by any crime or impurity. Some of theſe luſtrations were public, others private. There were three ſpecies or manners of performing luſtration, *viz.* by fire and ſulphur, by water, and by air, which laſt was done by fanning and agitating the air round the thing to be purified. Some of theſe luſtrations were neceſſary, that is, could not be diſpenſed with, as luſtrations of houſes in time of a plague, or upon the death of any perſon: others again were done out of choice, and at pleaſure. The public luſtrations at Rome were celebrated every fifth year, in which they led a victim thrice round the place to be purified, and in the mean time burnt a great quantity of perfumes. Their country luſtrations, which they called ambarvalia, were celebrated before they began to reap their corn: in thoſe of the armies, which they called armiluſtria, ſome choſen ſoldiers, crowned with laurel, led the victims, which were a cow, a ſheep, and a bull, thrice round the army ranged in battle-array in the field of Mars, to which deity the victims were afterwards ſacrificed, after pouring out many imprecations on the enemies of the Romans. The luſtrations of their flocks were performed in this manner: the ſhepherd ſprinkled them with pure water, and thrice ſurrounded his ſheepfold with a compoſition of ſavin, laurel, and brimſtone ſet on fire, and afterwards ſacrificed to the goddeſs Pales an offering of milk boiled, wine, a cake and millet. As for private houſes, they were luſtrated with water, a fumigation of laurel, juniper, olive-tree, ſavin, and ſuch like; and the victim commonly was a pig. Luſtrations made for particular perſons were commonly called expiations, and the victims piacula. There were alſo a kind of luſtration uſed for infants, by which they were purified, girls the third, and boys the ninth day after their birth, which ceremony was performed with

with pure water and ſpittle. See the article AMBARVALIA.

In their luſtratory ſacrifices the Athenians ſacrificed two men, one for the men of their city, and the other for the women. Divers of theſe expiations were auſtere: ſome faſted, others abſtained from all ſenſual pleaſures, and ſome, as the prieſts of Cybele, caſtrated themſelves. The poſtures of the penitents were different, according to the different ſacrifices. The prieſts changed their habits according to the ceremony to be performed; white, purple, and black, were the moſt uſual colours. They caſt into the river, or at leaſt out of the city, the animals or other things that had ſerved for a luſtration or ſacrifice of atonement, and thought themſelves threatned with ſome great misfortune when by chance they trod upon them. Part of theſe ceremonies were aboliſhed by the emperor Conſtantine, and his ſucceſſors; the reſt ſubſiſted till the gothic kings were maſters of Rome, under whom they expired, excepting what the popes thought proper to adopt and bring into the church.

For the luſtration, or rather expiation, of the antient Jews, ſee EXPIATION.

LUSTRE, the gloſs or brightneſs appearing on any thing, particularly on manufactures of ſilk, wool, or ſtuff. It is likewiſe uſed to denote the compoſition or manner of giving that gloſs.

The luſtre of ſilks is given them by waſhing in ſoap, then clear water, and dipping them in alum water cold. To give ſtuffs a beautiful luſtre, for every eight pounds of ſtuff allow a quarter of a pound of linſeed; boil it half an hour, and then ſtrain it through a cloth, and let it ſtand till it is turned almoſt to a jelly: afterwards put an ounce and a half of gum to diſſolve twenty-four hours; then mix the liquor, and put the cloth into this mixture; take it out, dry it in the ſhade, and preſs it. If once doing is not ſufficient, repeat the operation. Curriers give a luſtre to black leather firſt with juice of bar-berries, then with gum-arabic, ale, vinegar, and Flanders-glue, boiled together. For coloured leather, they uſe the white of an egg beaten in water. Moroccoes have their luſtre from juice of bar-berries and lemon or orange. For hats, the luſtre is frequently given with common water, ſometimes a little black dye is added: the ſame luſtre ſerves for furs, except that for very black furs they ſometimes prepare a luſtre of galls, copperas, roman alum, ox's marrow, and other ingredients.

LUSTRUM, in roman antiquity, a general muſter and review of all the citizens and their goods, which was performed by the cenſors every fifth year, who afterwards made a ſolemn luſtration. See the article LUSTRATION.

This cuſtom was firſt inſtituted by Servius Tullius, about 180 years after the foundation of Rome. In courſe of time the luſtra were not celebrated ſo often, for we find the fifth luſtrum celebrated at Rome only in the 574th year of that city.

LUSUC, or LUCKO, a city and biſhop's ſee of Poland: eaſt long. 25°, and north lat. 51° 5'.

LUTE, or LUTING, among chemiſts, a mixed, tenacious, ductile ſubſtance, which grows ſolid by drying, and being applied to the juncture of veſſels, ſtops them up ſo as to prevent the air from getting either in or out.

When the ſubject is merely aqueous, linſeed meal ground to fine powder, and well mixt or worked up into a ſtiff paſte with the white of an egg, makes a proper luting for the purpoſe; for being applied to the junctures of diſtilling veſſels, it grows hard with heat; and if it happens to crack, it is eaſily repaired by the application of freſh paſte, which ſoon grows ſolid as before. But a paſte made of the ſame meal, well worked up with cold water, very well anſwers the end in the diſtillation of all fermented inflammable ſpirits, and all volatile alkaline ſalts; but this paſte will not anſwer in the diſtillation of mild acids or acetous ſpirits, becauſe it ſoftens and diſſolves therewith, ſo as to let the fumes eſcape: in theſe caſes, therefore, a bladder ſteeped in water till it begins to grow ſlimy, makes an excellent luting, by being applied and preſſed wet upon the junctures of the diſtilling veſſels. A luting that acquires a ſtony hardneſs, is neceſſary in the diſtillation of the foſſile acids, as thoſe of vitriol, ſea-ſalt, &c. which kind of luting is called the philoſophical luting, and may be prepared from the calx of copperas and quick-lime, by boiling the caput mortuum of vitriol in ſeveral parcels of water till it is thus thoroughly waſhed from its ſaline part, then drying the powder, and preſerving it in a cloſe veſſel. This powder is to be rubbed with an equal quantity of ſtrong quick-lime, and wrought into a paſte with the whites of eggs firſt beat thin; and this luting is immediately to be

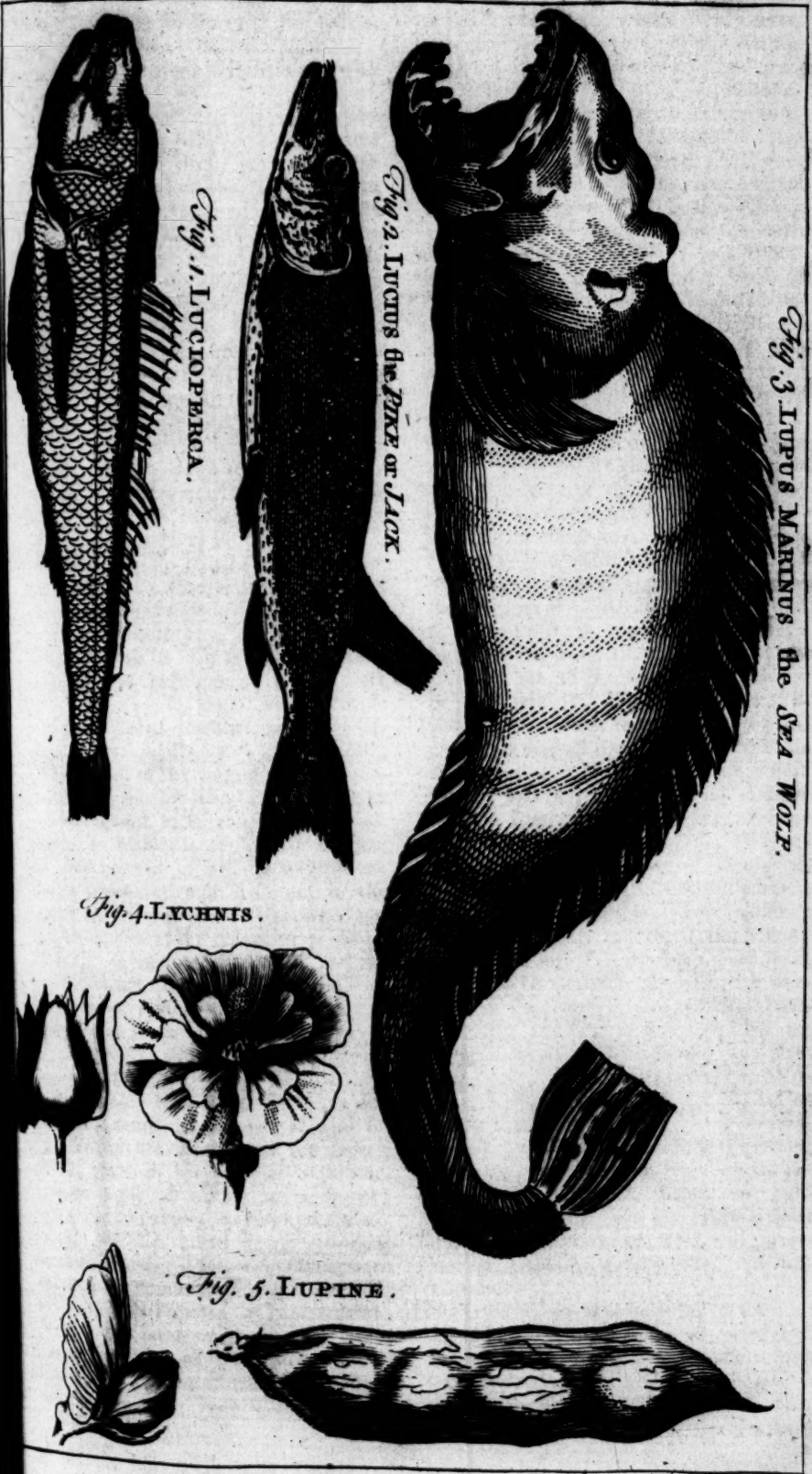


Fig. 1. LUCIOPERCA.

Fig. 2. LUCIUS the PIKE or JACK.

Fig. 3. LUPUS MARINUS the SEA WOLF.

Fig. 4. LYCHNIS.

Fig. 5. LUPINE.

J. Jefferys sculp.

BRITISH MUSEUM

be applied to the junctures of the veſſels, after their firſt being heated a little.

LUTE, is alſo a muſical inſtrument with ſtrings.

The lute conſiſts of four parts, *viz.* the table, the body or belly, which has nine or ten ſides; the neck, which has nine or ten ſtops or diviſions, marked with ſtrings; and the head, or croſs, where the ſcrew for raiſing and lowering the ſtrings to a proper pitch of tone are fixed. In the middle of the table there is a roſe or paſſage for the ſound; there is alſo a bridge that the ſtrings are faſtened to, and a piece of ivory between the head and the neck to which the other extremities of the ſtrings are fitted. In playing, the ſtrings are ſtruck with the right hand, and with the left the ſtops are preſſed. The lutes of Bologna are eſteemed the beſt on account of the wood, which is ſaid to have an uncommon diſpoſition for producing a ſweet ſound.

LUTHERANS, the chriſtians who follow the opinions of Martin Luther, one of the principal reformers of the church in the ſixteenth century.

This ſect took its riſe from the diſtaſte taken at the indulgences which were granted in 1517, by pope Leo X. to thoſe who contributed towards finiſhing St. Peter's church at Rome. John Stuptiz, vicar-general of the auguſtines in Germany, was the firſt who took occaſion to declare againſt theſe abuſes, for which purpoſe he made uſe of Martin Luther, the moſt learned of all the auguſtines. Luther was a native of Eiſleben, in the county of Mansfield in Saxony, and taught divinity at the univerſity of Wirtemberg; he mounted the pulpit, and declaimed vehemently againſt the abuſe of indulgences, and even fixed ninety-five propoſitions upon the church doors of Wirtemberg, in order to their being conſidered and examined in a public conference: againſt theſe John Tetzel, a dominican, publiſhed a hundred and ſix poſitions at Francfort upon the Oder; and by virtue of his office of inquiſitor, ordered thoſe of Luther to be burnt: when his adherents, to revenge the affront, publicly burnt at Wirtemberg thoſe of Tetzel. Thus war was declared between the dominicans and auguſtines, and ſoon after between the roman catholic and the lutheran party. In 1520, Luther ſent his book De Libertate Chriſtiana, to the pope; in which he grounds juſtification upon faith alone, without the aſſiſtance of good works; and aſſerts, that chriſtian liberty reſcues us from the bondage of human traditions, and particularly the ſlavery of papal impoſitions; and afterwards, in a remonſtrance written in high Dutch, he proceeded to deny the authority of the church of Rome. He was the ſame year excommunicated by the pope; upon which Luther cauſing a large fire to be made without the walls of Wirtemberg, threw the pope's bull into it with his own hands, together with the decretals, extravagants, and clementines; and this example was followed by his diſciples in other towns. The next year the emperor Charles V. ordered his books to be burnt, and put him under the ban of the empire as a heretic and ſchiſmatic; and about this time king Henry VIII. of England wrote againſt him in defence of the ſeven ſacraments, to which Luther wrote a reply.

The elector of Saxony, who had for ſome time kept him concealed in his caſtle of Weſberg, now gave him leave to reform the churches of Wirtemberg as he thought fit; when this reformer propoſed that the biſhops, abbots, and monks ſhould be expelled; that all the lands and revenues of the biſhoprics, abbies, and monaſteries, ſhould eſcheat to the reſpective princes; and that all the convents of mendicant friars ſhould be turned into public ſchools and hoſpitals: this year, Luther had the ſatisfaction to ſee a league contracted between Guſtavus king of Sweden, and Frederick king of Denmark, who both agreed to eſtabliſh lutheraniſm in their dominions: and now Luther's perſuaſion, which from the Upper Saxony had ſpread into the northern provinces, began to be perfectly ſettled in the dutchies of Lunenburg, Brunſwick, Mecklenburgh and Pomerania, and in the archbiſhoprics of Magdeburg and Bremen; in the towns of Hamburgh, Wiſmar, Roſtock, and along the Baltic as far as Livonia and Pruſſia. Luther maintained the doctrine of conſubſtantiation; and at a general diet at Ratiſbon for reconciling both parties, the divines could agree to no more than five or ſix articles concerning juſtification, free-will, original ſin, baptiſm, good works, and epiſcopacy.

LUTHERN, in architecture, a kind of window over the corniche, in the roof of a building; ſtanding perpendicularly over the naked of a wall, and ſerving to illuminate the upper ſtory.

Lutherns are of various forms, as ſquare, ſemi-circular, round, called bulls-eyes, flat arches, &c.

LUTON, a market-town, fourteen miles ſouth of Bedford.

LUTRA, the OTTER, in zoology. See the article OTTER.

LUTTERWORTH, a market-town, twelve miles ſouth of Leiceſter.

LUTUM, among chemiſts, denotes a lute; and lutum ſapientiæ, the hermetical ſeal. See LUTE and HERMETICAL.

LUTZEILSTEIN, a town of Germany, ſeventeen miles north of Straſburg.

LUTZEN, a town of Upper Saxony, in Germany, eight miles weſt of Leipſic.

LUXATION, *luxatio*, in ſurgery, is when any bone is moved out of its place, or articulation, ſo as to impede or deſtroy its proper motion or office: hence, it appears, that luxations are peculiar to ſuch bones as have moveable joints; but, in a common way of ſpeaking, people term it a luxation, when the bones of the noſe are diſplaced, or when epiphyſes are ſeparated from their bones in infants.

Thoſe, therefore, who deſire to be fully verſed in the knowledge and cure of luxations, ſhould have a clear idea and remembrance of the form of each articulation, with its ligaments and muſcles; which can only be obtained by a frequent and diligent inſpection of anatomical diſſections. See the article ANATOMY.

Luxations are generally diſtinguiſhed into perfect and imperfect: theſe laſt are when the bones are only diſlocated in part, yet ſo as that they cannot perform their office; whereas, in perfect luxations, the bones are wholly ſeparated or diſplaced from their articulation with each other.

As to the method of treating luxations, it is much the ſame with that uſed in fractures: for in both caſes, the whole deſign of the ſurgeon is, 1. To reſtore the bone to its place, firſt by extenſion, and then by reduction with his hands. 2. To preſerve and retain what is ſo replaced, in their natural poſition. 3. To prevent and cure the ſeveral ſymptoms uſually attending them.

To replace a luxated bone, the ſurgeon ought to regulate the aſſiſtant's extenſion, by ordering it to be ſtrong enough, and in a right direction; and, in the mean time, he is to compreſs the articulation gently with his hands and fingers, till he find the elapſed bone recover its right place; which is known to have been effected, if it be heard to ſnap in the reduction, or by the limb's being able to perform its office. In caſes where the luxation is attended with a fracture, the reduction muſt be put off till the fracture be well joined by a firm callus.

When the bones are properly reduced, they muſt be retained in their places by proper bandages and reſt; and when theſe happen in the lower extremities, the patient ſhould reſt a few days in his bed; moving the limb gently as ſoon as he finds it capable, and afterwards he may riſe and walk cautiouſly.

On the other hand, when the luxation is inveterate, and the ligaments have been much ſtretched by violent and long continued diſtention, it is highly neceſſary to make uſe of ſome bandage after reduction; and in the mean time, to bathe the part well with ſpirit of wine, hungary-water, or ſome other warm and ſtrengthening medicine, by which means the ligaments uſually become very firm and ſtrong.

As to the ſymptoms which happen before or after the reduction of a luxation, ſuch as inflammations, tumours, convulſions, hæmorrhages, &c. they muſt be treated in the manner directed under theſe articles. If a ſlight fever ſhould attend, bleeding, a thin diet, and cooling medicines are to be uſed. If an abceſs ſhould be formed, it ſhould be opened as ſoon as ripe, leſt the articulation and bones be corroded, which often make amputation of the limb neceſſary. If a luxation is attended with a fracture, it ſhould be reduced firſt, and the fracture ſet afterwards: and, laſtly, if the bones be diſlocated with ſuch violence as to break and deſtroy the ligaments, tendons, and adjacent ſkin, the only method left is ſpeedily to amputate the limb. See the article AMPUTATION.

Luxations of the jaw, clavicle, arm, and hand, are more readily reduced on a low ſtool; ſuch as happen in the vertebræ of the thighs, on a table; ſuch as happen in the legs or feet, on a bed; and, laſtly, those which happen on the ſhoulders or vertebræ of the neck, are moſt commodiouſly reduced on the floor. See JAW, HUMERUS, THIGH, VERTEBRÆ, &c.

LUXATION *of the ancle*. See the article ANCLE LUXATED.

LUXEMBURG, the capital of the dutchy of the ſame name, ſituated an hundred miles ſouth-eaſt of Bruſſels, is a ſmall but ſtrong fortreſs: eaſt long. 6° 8′, north lat. 49° 45′.

BRITISH MUSEUM

Fig. 1. LOXIA, the *CROSS-BILL.*

Fig. 3. LYCOPERDON.

Fig. 2. the LUNGS.

Fig. 4. LYCOPODIUM

T. Jefferys sculp.

LUZZARA, a town of Italy, twelve miles ſouth of Mantua.

LYBIA, a name antiently given to all the coaſt of Barbary, eſpecially that part lying weſtward of Egypt.

LYCANTHROPY, in medicine, a deep melancholy, wherein the patients imagine themſelves wolves; and accordingly ſhun company, and go into woods and lonely places, howling like wolves. See the article MELANCHOLY.

LYCAONIA, an antient province of leſſer Aſia, whereof Cogni is now the capital.

LYCEUM, in grecian antiquity, an academy ſituated upon the banks of the Iliſſus at Athens. It was compoſed of porticos and walks, where Ariſtotle taught philoſophy; walking there conſtantly every day till the hour of anointing, whence he and his followers were called peripatetics. See the article PERIPATETIC PHILOSOPHY.

LYCHAM, or LITCHAM, a market-town of Norfolk, eighteen miles weſt of Norwich.

LYCHNIS, CATCH-FLY, or CUCKOW-FLOWER, in botany, a genus of the decandria-pentagynia claſs of plants, the flower of which conſiſts of five petals; the ungues of which equal the cup in length, and their limb is plain; the nectarium is compoſed of two denticles, placed in the neck of each petal: the fruit is a capſule, approaching to an oval figure, covered, and containing only one cell, with numerous roundiſh ſeeds. See plate CLXIII. fig. 4.

LYCIUM, AVIGNON-THORN, in botany, a genus of the pentandria-monogynia claſs of plants, the corolla of which is a ſingle funnel-like petal, with a cylindraceous tube, and the limb divided into five ſegments: the fruit is a roundiſh bilocular berry, containing a great many kidney-ſhaped ſeeds.

LYCODONTES, in natural hiſtory, the petrified teeth of the lupus-piſcis, or wolf-fiſh, frequently found foſſile. They are of different ſhapes, but the moſt common kind riſe into a ſemiorbicular form, and are hollow within, ſomewhat reſembling an acorn-cup: this hollow is found ſometimes empty, and ſometimes filled with the ſtratum in which it is immerſed. Many of them have an outer-circle, of a different colour from the reſt.

LYCOPERDON, PUFF BALL, in botany, a genus of funguſes, of a fleſhy ſubſtance like other muſhrooms, and roundiſh ſhape. They are ſometimes ſeſſile, and ſometimes ſtand on a thick pedicle: they produce ſeparate male and female flowers, contained in the cellular fungous ſubſtance; which remains a long time confuſed, and the fructifications not formed; and when they are formed, and the cells diſtinct, it is but a very ſhort time before the very matter of the cells breaks to powder, and the ſeeds fall out of the cavities of the placentæ; and the whole matter, powder, ſeeds, and filaments of the placentæ, are diſcharged altogether in form of a fine duſt.

Of this genus there are a great many ſpecies, the moſt remarkable of which is the ſtarry lycoperdon, or puff-ball, with multifid rays, and a ſtellated oſculum. See plate CLXIV. fig. 3. n° 1. to which we may add the pediculated lycoperdon, with a hairy lacerated volva, *ibid.* n° 2.

LYCOPODIUM, WOLF'S CLAW-MOSS, in botany, a genus of moſſes conſiſting of branches, furniſhed with leaves, and producing ſpikes formed of ſquamæ, of a different figure from the leaves; at the baſes of which are placed capſules, of a kidney-like ſhape, which have no cup or vagina; and, when ripe, open longitudinally into two parts, and diſcharge a great quantity of fine powder.

The lycopodiums have all one general appearance, by which they may be diſtinguiſhed to belong to the ſame family; only in ſome, the ſpikes are continuous to the reſt of the ſtalk, and in others, they are ſupported on peculiar pedicles. See plate CLXIV. fig. 4. n° 1 and 2.

LYCOPSIS, in botany, a genus of the pentandria-monogynia claſs of plants, comprehending the echioides and buglooſſoides of Rivinus, and the bugloſſum of Moriſon; its corolla conſiſts of a ſingle petal, with a cylindraceous tube, and a ſemiquinquifid limb: the calyx anſwers to the purpoſe of a pericarpium, containing four oblong ſeeds. It is nearly allied to echium, or viper's bugloſs. See the article ECHIUM.

LYCOPUS, WATER HOREHOUND, in botany, a genus of the diandria-monogynia claſs of plants, the flower of which conſiſts of a ſingle petal, with a cylindraceous tube, and a quadrifid limb: there is no fruit; the ſeeds, which are four and roundiſh, being lodged in the cup.

LYDIA, an antient province of leſſer Aſia, in which was the city of Philadelphia.

LYGEUM, in botany, a genus of the triandria-monogynia claſs of plants, the calyx of which is a ſingle leafed, convolute,

oval, acuminated ſpatha: the corollæ are two in number, equal, and placed on the germen: the fruit is an oblong very hairy nut, containing two cells, in which is a ſingle, oblong, linear ſeed, convex on one ſide, and plane on the other.

LYING IN-WOMEN, in midwifery, thoſe lately delivered of a child. See the articles DELIVERY, LOCHIA, &c.

After-pains are the moſt common complaint to which lying-in-women are ſubject; and as theſe are uſeful, ſerving to promote the lochia, and the diſcharge of clotted blood, nothing more is neceſſary than to keep the woman warm, by applying a warm cloth to the belly. Exceſſive after-pains are greatly mitigated by carminative, aromatic, and nervous medicines; and in caſe the woman is coſtive, an emollient clyſter is proper.

In difficult labours, the vagina and external parts are ſubject to contuſions, inflammations, and dilacerations. In caſe of contuſion, La Motte recommends embrocations with warm wine, with a little chervil in it; and as to lacerations of the perinæum or vagina, the ſame author adviſes a reunion by the ſuture, whilſt the wound is recent. Contuſions, inflammations, and even mortifications, are often cauſed by a midwife's too rudely handling the parts; in which caſes, bleeding, ſcarification, and embrocation become neceſſary. In ſlighter excoriations, it will be ſufficient to bathe the parts with warm milk, barley-water, a decoction of liquorice and chervil; and afterwards, to embrocate with wine and chervil.

In caſe of a bilious diarrhœa, which often proves a very terrible ſymptom, it is uſual to give abſorbent powders, and afterwards the bitter extracts, with ſmall doſes of rhubarb. Aſtringents and an improper uſe of opium are very dangerous. Flatulencies are cured by carminatives, aromatics, and abſorbent powders.

LYME, a borough and port-town of Dorſetſhire, eaſt long. 3° 5′, and north lat. 50° 44′.

It ſends two members to parliament.

LYMPH, *lympha*, a fine fluid, ſeparated in the body from the maſs of blood, and contained in peculiar veſſels.

Dr. Keil ſays, that the lymph being chemically examined, will be found to contain a great deal of volatile, but no fixed ſalt, ſome phlegm, ſome ſulphur, and a little earth. The uſe of the lymph, he obſerves, may be gathered from the conſideration of the parts into which it diſcharges itſelf: that which comes from the head, neck, and arms, is thrown into the jugular and ſubclavian veins; all the lymphatics which the parts in the cavity of the thorax ſend out, empty themſelves into the thoracic duct; and the lymph from all the reſt of the body, flows to the receptacle of the chyle; ſo that there can be no doubt but its chief uſe is to dilute and perfect the chyle before it mixes with the blood. Now the whole lymph which is ſeparated from the blood, being requiſite for this uſe, it is plain there could be no glands in the abdomen, appropriated for the ſeparation of the whole lymph, but what muſt have had a very great ſhare of the blood which paſſes through the aorta, in order to ſeparate ſo great a quantity of lymph; but the liver and kidneys requiring alſo a great quantity of blood, and which could not be avoided, nature choſe to ſeparate the lymph from the blood which goes to all the parts of the body, rather than appoint particular glands for it in the abdomen, which would have been more at hand, but would have robbed the other parts of a large quantity of blood, and occaſioned a very unequal diſtribution of it.

For the lymphatic glands, ſee GLAND.

There are three ſorts of veſſels which go by the name of lymphatics, whereas formerly that word was uſed to ſignify the tranſparent veſſels, which accompany the lymphatic glands. The original ſources of theſe veſſels, Winſlow obſerves, are very difficult to be found out, and even their diſtribution through the body has not been ſufficiently traced to enable us to deſcribe them particularly. As to their termination, we are ſure, that, for the moſt part, they end in the thoracic duct. Beſides theſe veſſels which accompany the glands there are others, of the ſame ſtructure found on the ſeveral viſcera, where no lymphatic glands have yet been diſcovered. We meet with them in very great numbers in the external membrane of the liver, and in the duplicature of the ſuperior membranous ligament of this organ. Several diſcoveries about theſe veſſels have been made in brutes.

The third ſort of veſſels, termed lymphatic veſſels, are the ſmall arteries and veins which in the natural ſtate tranſmit only the ſerous part of the blood. Theſe veſ-

fels differ from thoſe of the firſt, in the ſmallneſs of their diameter, and in their ſtructure and ſituation. All theſe little arteries and veins are uniform, extremely narrow, and though their ſides are not thinner than thoſe of the valvular lymphatics, yet their diameters are generally leſs. The other lymphatics are full of valves and very thin, but they are not narrow in proportion. The arterial and venous lymphatics are found on the parts which are naturally white, as on the ſkin, and the white of the eye; and their origin are eaſily diſcoverable; but the valvular lymphatics are confined to the internal parts of the body, and are found on the parts of all colours; but we cannot eaſily trace them to their original ſtate.

LYMPHATICS, or LYMPHEDUCTS, in anatomy. See the preceding article.

LYNN-REGIS, a port-town of Norfolk, ſituated at the mouth of the river Ouſe, on a bay of the German ſea, thirty-two miles weſt of Norwich.

It ſends two members to parliament.

LYNX, or OUNCE, in zoology, a ſpecies of the felis kind, with a truncated tail, a brown body ſpotted with black; the head is large, but not very long; the forehead is flat, the eyes are large and fierce; the ears are very large and open, but they terminate in a point at the top, and are there ornamented with a pencil of fine black hairs; the mouth is furniſhed with very terrible teeth, and there are whiſkers about it, as alſo over the eyes; the neck is long and thick, the breaſt large and broad, the legs ſtrong, the claws terrible, the tail ſhort and abrupt; and the whole animal large and robuſt, ſomewhat leſs than the lion, very fierce, and remarkable for the quickneſs of its ſight.

LYON, or LION. See the article LION.

LYON, or LION, *King at arms*. See KING *at arms*, and COLLEGE *of heralds*.

LYONS, the capital of the Lyonois, a province of France, bounded by Orleanois and Burgundy on the north, by la Breſſe and Dauphine on the eaſt, by Languedoc and Guienne on the ſouth, and by another part of Guienne and Orleanois on the weſt. This city lies upon the confluence of the rivers Rhone and Soan, in eaſt long. 4° 55′, and north lat. 45° 50′. Next to Paris, it is eſteemed the place of greateſt trade in France.

LYRA, in ichthyology, the name of a fiſh of the cuculus or gurnard-kind, of which there are two ſpecies, the one called tibicen. See the article TIBICEN.

The other, the lyra cornuta, or horned harp-fiſh, of an octogonal form, covered all over with bony ſcales, which are of a rhomboidal figure, each having in its middle a ſharp and ſtrong prickle, bending backwards; its ſnout divides towards the extremity into two large horns, on which are placed two perpendicular ſpines, which with a third above, makes an acute angle: its mouth is large, but it has no teeth.

LYRA is alſo the name of a beautiful ſea-ſhell, of the genus of the concha globoſa, or dolium.

LYRE, *lyra*, a muſical inſtrument of the ſtring-kind, much uſed by the antients. See the article CITHARA.

Ammianus Marcellinus ſays, that there were lyres as big as calaſhes. Quintilian ſays, that the muſicians having divided the ſounds of the lyre into five ſcales, each of which had ſeveral degrees, they have placed between the ſtrings which give the firſt tones of each of thoſe ſcales, other ſtrings which gave intermediate ſounds; and theſe ſtrings have been multiplied in ſuch a manner, that to paſs from one of the five maſter-ſtrings to the other, there are as many ſtrings as there are ſcales. The crier who proclaimed the laws, among the Greeks, was accompanied by a harper or player on the lyre.

From the lyre, which all agree to have been the firſt inſtrument of the ſtring-kind in Greece, aroſe an infinite number of others, differing in ſhape and number of ſtrings, as the pſalterion, trigon, ſambucus, pectis, magadis, barbiton, teſtudo, (the two laſt are uſed promiſcuouſly by Horace with cythara and lyra) epigonium, ſimmicium, and pandoron; which were all ſtruck with the hand, a plectrum or a little iron-rod. We have no ſatisfactory account of their ſhape, ſtructure, or number of ſtrings; their bare names only have been tranſmitted to us by the antients. We find, indeed, numbers of inſtruments on old medals; but whether they are any of theſe, we cannot find out. The modern lyre, or welſh-harp, conſiſting of forty ſtrings, is ſufficiently known.

The lyre among poets, painters, ſtatuaries, carvers, &c. is attributed to Apollo and the Muſes.

LYRE, *lyra*, in aſtronomy, a conſtellation of

of the northern hemiſphere, the number of whoſe ſtars, in Ptolemy's and Tycho's catalogues are only 10, but 19 in the Britannic catalogue.

LYRIC, in general, ſignifies ſomething ſung or played on the lyre: but it is more particularly applied to the antient odes and ſtanzas, anſwering to our airs and ſongs, and may be played on inſtruments. This ſpecies of poetry was originally employed in celebrating the praiſes of gods and heroes, though it was afterwards introduced into feaſts and public diverſions. Mr. Barnes ſhews how unjuſt it is to exclude heroic ſubjects from this kind of verſe, which is capable of all the elevation ſuch matters require. The characteriſtic of this kind of poetry is, according to Trap, the ſweetneſs and variety of the verſe, the delicacy of the words and thoughts, the agreeableneſs of the numbers, and the deſcription of things moſt pleaſing in their own natures. At firſt the lyric verſe was only of one kind, but afterwards they ſo continued to vary the feet and numbers, that the variety of them now are almoſt innumerable.

This kind of poem is diſtinguiſhed from all other odes by the happy tranſitions and digreſſions which it beautifully admits, and the ſurpriſing and natural eaſy returns to the ſubject, which is not to be obtained without great judgment and genius.

The lyric is, of all kinds of poetry, the moſt poetical, and is as diſtinct, both in ſtyle and thought, from the reſt, as poetry is in general from proſe: it is the boldeſt of all other kinds, full of rapture, and elevated from common language the moſt that is poſſible: ſome odes there are likewiſe, in the free and looſe manner, which ſeems to avoid all method, and yet are conducted by a very clear one; which affects tranſitions ſeemingly without art, but for that reaſon have the more of it; which are above connection, and delight in exclamations and frequent invocations of the muſes; which begin and end abruptly, and are carried on through a variety of matter with a ſort of divine pathos, above rules and laws, and without regard to the common forms of grammar. Pindar has ſet his ſucceſſors the example of digreſſions and excurſions. To write a lyric poem are required not only a flowing imagination, brightneſs, life, ſublimity, and elegance, but the niceſt art and fineſt judgment, ſo as to ſeem luxuriant, and not be ſo; and under the ſhew of tranſgreſſing all laws, to preſerve them.

LYSIMACHIA, WILLOW-HERB, in botany, a genus of the pentandria monogynia claſs of plants, the corolla whereof conſiſts of a ſingle petal; the tube is ſcarce diſcernible; the limb is divided into five ovato-oblong ſegments; the fruit is a capſule of a globoſe figure, compoſed of ten valves, and having only one cell; the ſeeds are numerous, and angulated, the receptacle globoſe, large, and punctuated.

LYTHRUM, in botany, a genus of the dodecandria-monogynia claſs of plants, the corolla whereof conſiſts of ſix oblong, obtuſe, patent petals, inſerted by their ungues into the ſegments of the cup; the fruit is an oblong, acuminated, and bilocular capſule, containing a great number of ſmall ſeeds.

M.

M, Or m, the twelfth letter and ninth conſonant of our alphabet: it is a liquid and labial conſonant, pronounced by ſtriking or moving the under lip againſt the upper one: its ſound is always the ſame in engliſh, and it admits no conſonant after it in the beginning of words and ſyllables, except in ſome greek words, nor does it come after any in that caſe. It ſuffers not the ſound of n, coming after it, to be heard, as in autumn, ſolemn, &c.

As a numeral, M ſtands for mille, a thouſand; and with a daſh over it, thus, $\overline{M}$, for a thouſand times a thouſand, or, 1000000. Uſed as an abbreviature, M, ſignifies Manilius, Marcus, Martius, Mucius; and M'. Manius; M. B. mulier bona; Mag. Eq. magiſter equitum; Mag. Mil. magiſter militum; M. M. P. manu mancipio poteſtate; M. A. magiſter artium; M. S. manuſcript; and M. S. S. manuſcripts, in the plural. In the preſcription of phyſicians, M. ſtands

ſtands for manipulus, a handful; and ſometimes for miſce, or mixtura: thus M. F. Jupalium, ſignifies mix and make into a julep. In aſtronomy, &c. M is uſed for meridian or meridional; and, in law, M. is the ſtigma burnt on the brawny part of the left thumb of a perſon convicted of manſlaughter.

MABBY, according to Mr. Boyle, is a kind of wine made from potatoes, and ſaid to be uſed in Barbadoes.

MAC, an iriſh word, ſignifying a ſon, frequently added to the beginning of ſurnames, as Mac Donald, for Donaldſon; Mac Laurin, for Laurence's ſon, &c.

MACAO, an iſland of China, in the province of Canton, fifty miles ſouth of Canton.

MACAO, or MACAW, in ornithology, a name given to the larger ſpecies of parrots with very long tails. See PARROT, and ERYTHROCYANEUS.

MACARONIC, or MACARONIAN, an appellation given to a burleſque kind of poetry, made up of a jumble of words of different languages, and words of the vulgar tongue latinized.

The Italians are ſaid to have been the inventors of it. The Germans, French, Spaniards, &c. have alſo had their macaronic poets; nor is Great Britain outdone in this reſpect, witneſs Drummond of Hauthornden's poem called Polemo Middinia, which begins thus:

Nymphæ, quæ colitis highiſſima monta Fifæa,
Seu vos Pittenweema tenet, ſeu Crelia croſta, &c.

MACAROON, a delicious cake, ſaid to be the favourite of the Italians, as pudding is in England; from whence it is remarked, that the merry-andrews of all nations are called by the national character: thus, in England, they are called jack-puddings; in Holland, pickle herrings; in Italy, macaroons, &c.

MACASSER, a large iſland in the Eaſt-Indies. See the article CELEBES.

MACCABEES, two apocryphal books of ſcripture; ſo called from Judas Mattathias, ſurnamed Maccabeus. The firſt book of the Maccabees is an excellent hiſtory, and comes neareſt to the ſtyle and manner of the ſacred hiſtorians of any extant. It contains the hiſtory of forty years, from the reign of Antiochus Epiphanes to the death of Simon the high prieſt; that is, from the year of the world 3829 to the year 3869, 131 years before Chriſt. The ſecond book of the Maccabees begins with two epiſtles ſent from the Jews of Jeruſalem to the Jews of Egypt and Alexandria, to exhort them to obſerve the feaſt of the dedication of the new altar, erected by Judas on his purifying the temple. After theſe epiſtles follows the preface of the author to his hiſtory, which is an abridgment of a larger work, compoſed by one Jaſon, a Jew of Cyrene, who wrote the hiſtory of Judas Maccabeus, and his brethren, and the wars againſt Antiochus Epiphanes, and Eupator his ſon. This ſecond book does not, by any means, equal the accuracy and excellency of the firſt. It contains a hiſtory of about fifteen years, from the execution of Heliodorus's commiſſion, who was ſent by Seleucus to fetch away the treaſures of the temple, to the victory obtained by Judas Maccabeus over Nicanor; that is, from the year of the world 3828, to the year 3843, 147 years before Chriſt.

Upon the whole, it muſt be acknowledged, that there are great errors, and often different and even contradictory accounts to be found in them, eſpecially in the ſecond, ariſing probably either from ignorance of the greek and roman hiſtory, or from national prejudice and an immoderate partiality in favour of the jewiſh nation.

The romaniſts receive four books of the Maccabees, of which the two firſt, already mentioned, are with them canonical, and the two laſt apocryphal.

MACCLESFIELD, a market town of Cheſhire, thirty-five miles eaſt of Cheſter, from whence the noble family of Parker take the title of earl.

MACE, the ſecond coat or covering of the kernel of the nutmeg, is a thin and membranaceous ſubſtance, of an oleaginous nature and a yelloviſh colour; being met with in flakes of an inch and more in length, which are divided into a multitude of ramifications. It is of an extremely fragrant, aromatic and agreeable flavour, and of a pleaſant, but acrid and oleaginous taſte. See the article NUTMEG.

Mace is carminative, ſtomachic and aſtringent; and poſſeſſes all the virtues of nutmeg, but is leſs aſtringent. Nurſes are ſaid to apply oil of mace, by expreſſion, to children's navels to eaſe their gripes, and that often with ſucceſs; and rubbed on the temples, it is ſaid to promote ſleep. Its oil, by diſtillation, is very proper to be added to the ſtronger cathartics in form of pills by way of corrective.

Mace

Mace, the pound, pays on importation, 3 s. $0\frac{77\frac{2}{5}}{100}$ d. and draws back, on exportation, 2 s. $8\frac{66\frac{2}{5}}{100}$ d.

MACEDONIA, a province of European Turky, bounded by Servia and Romania, on the north and east; by the gulphs of Salonichi, Conteſſa and Theſſaly, on the ſouth; and by Albania and Epirus on the weſt.

MACERATA, a city of the marquiſate of Ancona, in the territories of the pope: eaſt long. 15°. north lat. 43°, 15'.

MACERATION, in pharmacy, is an infuſion of, or ſoaking ingredients in water, or any other fluid, in order either to ſoften them, or draw out their virtues. Lemery defines maceration to be a ſort of digeſtion confined to thick ſubſtances: thus, ſays he, when roſe-leaves are put into fat, in order to make oil of roſes, this mixture is, for ſome days, expoſed to the ſun, in order to macerate, that the quality of the roſes may be the better conveyed to the fat.

MACHIAN, a ſmall iſland of the Moluccas, which produces the beſt cloves: it is ſituated under the equator, in 125° eaſt long. and is ſubject to the Dutch.

MACHINE, *machina*, in general, whatever hath force ſufficient to raiſe or ſtop the motion of a heavy body.

Machines are either ſimple or compound; the ſimple ones are the ſeven mechanical powers, *viz.* lever, ballance, pully, axis and wheel, wedge, ſcrew, and inclined plane. See the articles POWER, LEVER, BALLANCE, *&c.*

From theſe the compound ones are formed by various combinations, and ſerve for different purpoſes; in all which, the ſame general laws take place, *viz.* that the power and weight ſuſtain each other, when they are in the inverſe proportion of the velocities they would have in the directions wherein they act if they were put in motion. Now, to apply this law to any compound machine, there are four things to be conſidered: 1. The moving power, or the force that puts the machine in motion; which may be either men or other animals, weights, ſprings, the wind, a ſtream of water, *&c.* 2. The velocity of this power, or the ſpace it moves over in a given time. 3. The reſiſtance, or quantity of the weight to be moved. 4. The velocity of this weight, or the ſpace it moves over in the ſame given time.

The two firſt of theſe quantities are always in the reciprocal proportion of the two laſt; that is, the product of the firſt two muſt always be equal to that of the laſt: hence, three of theſe quantities being given, it is eaſy to find the fourth; for example, if the quantity of the power be 4, its velocity 15, and the velocity of the weight 2, then the reſiſtance, or quantity of the weight will be equal to $\frac{4 \times 15}{2} = \frac{60}{2} = 30$.

Compound machines are extremely numerous, as mills, pumps, wheel-carriages, clocks, fire-engines, *&c.* See the articles ENGINE, MILL, PUMP, WATER-WORKS, *&c.*

In plate CLXV. fig. 1. is a compound machine, wherein are combined all the ſimple mechanical powers. It is contained in a frame A B C D, faſtened by the nut *n* upon the ſtand *n* O, and held together by the pillars V W and B *q*. The piece E F, whoſe ſanes, or flies, may be put in motion by the wind, or drawn by a hair faſtened at F, repreſents the lever and ballance. 2. At right angles to this is joined the perpendicular ſpindle G H, having upon it the endleſs ſcrew H, which may alſo be conſidered as a wedge. 3. This endleſs ſcrew, or worm, takes the ſkew teeth of the wheel K, which is the axis in peritrochio; and in turning round, winds up the ſtring L M upon its axis, which paſſing round the pullies at M and N, or drawing by a tackle of five, raiſes the weight P. But as the ſcrew has no progreſſive motion on its axis, it cannot here be ſaid to take in the inclined plane; therefore, to make this engine take in all the mechanical powers, we may add the inclined plane *r q* Q R, by making it reſt on the ground at Q R, and on the pillar *q* B at *r*, whereby the force of the power, drawing at F, will be farther increaſed in the ratio of Q T, the length of the plane, to T S, its height.

The whole force gained by this machine is found by comparing the ſpace gone through by the point F, with the height that the weight is raiſed in any determinate number of revolutions of F; and this force is ſo conſiderable, that an hundred pounds weight at P will be eaſily raiſed by the hair of a man's head drawing at F.

In cranes, and many other machines the power is ſo applied to one part of the machine

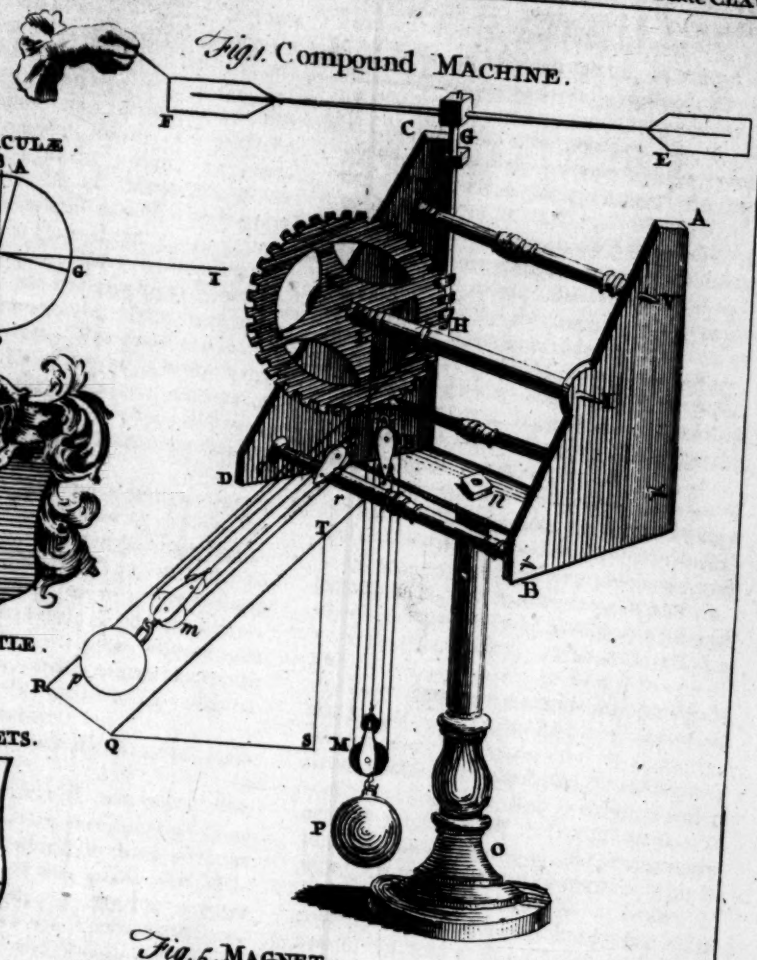
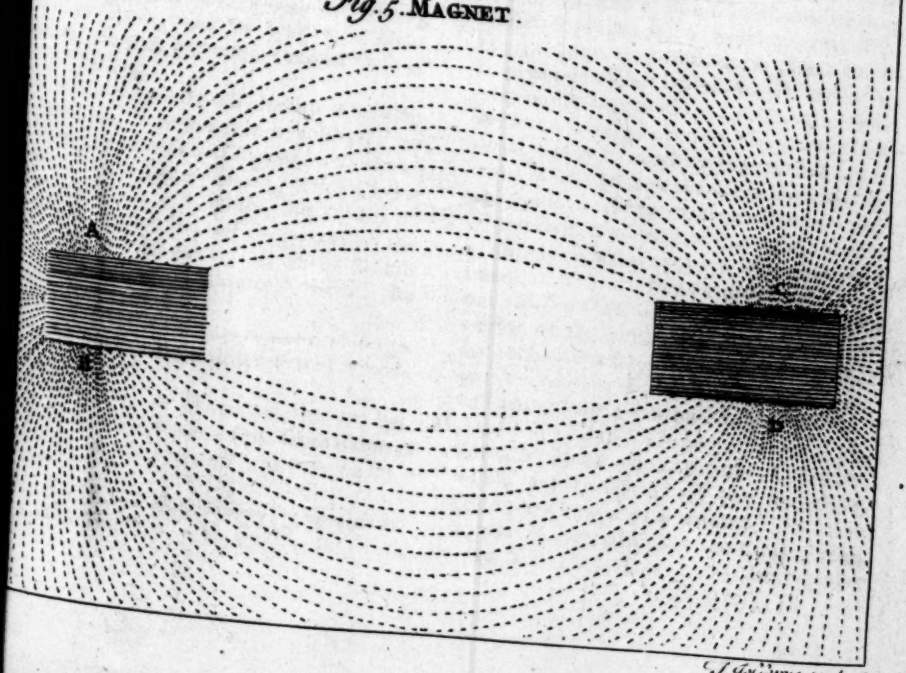


Fig. 5. MAGNET.



J. Fosbrooke sculp.

BRITISH MUSEUM

machine as to act immediately upon the weight; but there are others, as the engine for driving piles, in which the force of the power is accumulated before the weight is acted on at all. See the articles CRANE, ENGINE, FLY, &c.

As deſcriptions and draughts of machines, inſtruments, tools, &c. muſt be very acceptable to the public, we have, through the courſe of this work, given the conſtructions and uſes of a very great number; ſome from Belidor's Architecture hydraulique, others from Deſaguliers, Hales. the Philoſophical Tranſactions, 'S Graveſande, Muſchenbroek, Martin, Moxon, Varignon's Mechanique, Heiſter's Surgery, with other books both on the liberal and mechanical arts; and where theſe proved deficient, ſome have been taken from original deſigns.

MACHINERY, in epic and dramatic poetry, is when the poet introduces the uſe of machines, or brings ſome ſupernatural being upon the ſtage, in order to ſolve ſome difficulty, or to perform ſome exploit out of the reach of human power. The antient dramatic poets never made uſe of machines, unleſs where there was an abſolute neceſſity for ſo doing; whence the precept of Horace,

Nec Deus interſit, niſi dignus vindice nodus—inciderit.

It is quite otherwiſe with epic poets, who introduce machines in every part of their poem; ſo that nothing is done without the intervention of the gods. In Milton's Paradiſe Loſt, by far the greater part of the actors are ſupernatural perſonages: Homer and Virgil do nothing without them; and in Voltaire's Henriade, the poet has made excellent uſe of St. Louis.

As to the manner in which theſe machines ſhould act, it is ſometimes inviſibly, by ſimple inſpirations and ſuggeſtions; ſometimes by actually appearing under ſome human form; and, laſtly, by means of dreams and oracles, which partake of the other two. However, all theſe ſhould be ſo managed as to keep within the bounds of probability.

MACHINLETH, a market town of north Wales, twenty-eight miles weſt of Montgomery.

MACKERAN, or MACKAN, the capital of a province in Perſia of the ſame name; ſituated in eaſt long. 66°, and north lat. 26°.

MACKREL, in ichthyology, a ſpecies of ſcomber, with five pinnules at the extremity of the back, and a ſpine at the anus. See the article SCOMBER.

MACRO, or MACRONISSA, an iſland of the Archipelago, twenty miles eaſt of Athens.

MACROCERCI, in zoology, a name given to that claſs of animalcules, with tails longer than their bodies. See the article ANIMALCULE.

MACROCOSM, an affected term uſed by ſome for the univerſe, in contradiſtinction to microcoſm. See MICROCOSM.

MACROLOGY, in rhetoric, a too copious ſtyle. See the article STYLE.

MACROPYRENIUM, in natural hiſtory, a genus of foſſils, conſiſting of cruſtated ſeptariæ, with a long nucleus ſtanding out at each end of the maſs. See the article SEPTARIÆ.

Of this genus there is only one known ſpecies. This is one of the moſt ſingular and extraordinary bodies of the mineral kingdom: it is of a cloſe, compact, and firm texture, of a very rugged and unequal ſurface, ever of a determinate and very ſingular ſhape, which is an oblong and cylindric figure: in ſize, it is one of the moſt determinate and regular of all the native foſſils: its length is between ſeven and eight inches, and its diameter, in the center or thickeſt part, three inches; when broken, we find it compoſed of a central nucleus, of a ferrugineous colour, naturally hollow, but commonly filled up with an earthy matter; this is incloſed in a thin cruſt of a browniſh matter, of almoſt equal hardneſs; theſe are ſurrounded with a ſingle, double, or, in ſome ſpecimens, a triple circular ſeptum, of an elegant columnar ſpar, which is again environed by two thick cruſts of a browniſh matter of the kind of the reſt of the ſeptariæ; this makes the body of the maſs, and is divided by four or five other ſepta, parting like rays from the circular one, and making ſtraight towards the circumference of the ſtone; and the whole of this is ſurrounded with a rugged and unequal, white, browniſh coat of about one third of an inch in diameter; the cavity of the central nucleus is of half an inch diameter, and the nucleus itſelf is a very heavy body, of great hardneſs, and capable of a fine poliſh.

MACROTELOSTYLA, in natural hiſtory, a name of a genus of cryſtals, which are compoſed of two pyramids, joined to the end of a column; both the pyramids, as alſo the column, being

hexangular, and the whole body conſequently compoſed of eighteen planes. See the article CRYSTAL.

MACULÆ, in aſtronomy, dark ſpots appearing on the luminous faces of the ſun, moon, and even ſome of the planets; in which ſenſe they ſtand contradiſtinguiſhed from faculæ. See FACULÆ.

Theſe ſpots are moſt numerous and eaſily obſerved in the ſun. It is not uncommon to ſee them in various forms, magnitudes and numbers, moving over the ſun's diſk. They were firſt of all diſcovered by the lyncean aſtronomer Galileo, in the year 1610, ſoon after he had finiſhed his new invented teleſcope. That theſe ſpots adhere to, or float upon, the ſurface of the ſun, is evident for many reaſons. 1. Many of them are obſerved to break out near the middle of the ſun's diſk; others to decay and vaniſh there, or at ſome diſtance from his limb. 2. Their apparent velocities are always greateſt over the middle of the diſk, and gradually ſlower from thence on each ſide towards the limb. 3. The ſhape of the ſpots varies according to their poſition on the ſeveral parts of the diſk: thoſe which are round and broad in the middle, grow oblong and ſlender as they approach the limb, according as they ought to appear by the rules of optics.

By comparing many obſervations of the intervals of time in which the ſpots made their revolution, by Galileo, Caſſini, Scheiner, Hevelius, Dr. Halley, Dr. Derham, and others, it is found that 27 days, 12 hours, 20 minutes, is the meaſure of one of them at a mean; but in this time the earth deſcribes the angular motion of 26° 22′, about the ſun's center: therefore ſay, as the angular motion of 360° + 26° 22′, is to 360°; ſo is 27 days, 12 hours, 20 minutes, to 25 days, 15 hours, 16 minutes; which, therefore, is the time of the ſun's revolution about its axis.

Had the ſpots moved over the ſun in right lined directions, it would have ſhewn the ſun's axis to have been perpendicular to the plane of the ecliptic, but ſince they move in a curvilinear path, it proves his axis inclined to the axis of the ecliptic, and it is found by obſervation, that the angle is equal to 7° 30′; that is, if B D (plate CLXV, fig. 2.) paſſing through the center of the ſun C, be perpendicular to the plane of the earth's equator H I, then will the axis of the ſun's motion, A E, contain, with that perpendicular, the angle A C B, = 7° 30′ = G C I, the angle which the equator of the ſun G P makes with the plane of the ecliptic: and the points in which a plane, paſſing through the perpendicular B D and axis A E, cuts the ecliptic are in the eighth degree of piſces, on the ſide next the ſun's north pole A, and conſequently in the eighth degree of virgo, on the other ſide next the ſun's ſouth pole E. Scheiner had determined the angle B C A to be 7°, and Caſſini made it eight by his obſervations, which is the reaſon why 7°, 30′, is choſen for a mean.

As to the magnitude of the ſpots, they are very conſiderable, as will appear if we obſerve that ſome of them are ſo large as to be plainly viſible to the naked eye: thus Galileo ſaw one of them in the year 1612; and Mr. Martin aſſures us, that he knew two gentlemen that thus viewed them within a few years paſt: whence he concludes, that theſe ſpots muſt therefore ſubtend, at leaſt, an angle of one minute. Now the diameter of the earth, if removed to the ſun, would ſubtend an angle of but 20″; ſo that the diameter of a ſpot, juſt viſible to the naked eye, is, to the diameter of the earth, as 60 to 20, or as 3 to 1; and, therefore, the ſurface of the ſpot, if circular, to a great circle of the earth, is as 9 to 1: but 4 great circles are equal to the earth's ſuperficies; whence the ſurface of the ſpot is, to the ſurface of the earth, as 9 to 4; or as 2 ¼ to 1. Gaſſendus ſays, he ſaw a ſpot whoſe diameter was equal to $\frac{1}{20}$ of that of the ſun, and therefore ſubtended an angle at the eye of 1′ 30″; its ſurface was therefore 5 times larger than the ſurface of the whole earth. What theſe ſpots are, it is preſumed, nobody can tell; but they ſeem to be rather thin ſubſtances than ſolid bodies, becauſe they loſe the appearance of ſolidity in going off the diſk of the ſun: they reſemble ſomething of the nature of ſcum or ſcoria, ſwimming on the ſurface, which are generated and diſſolved by cauſes little known to us: but whatever theſe ſolar ſpots are, it is certain they are produced from cauſes very inconſtant and irregular; for Scheiner ſays he frequently ſaw fifty at once, but for twenty years after ſcarce any appeared. And in this century the ſpots were very frequent and numerous till the year 1741, when, for three years ſucceſſively, very few appeared; and now, ſince the year 1744 they have again appeared as uſual.

Theſe

These maculæ are not peculiar to the ſun, they have been obſerved in all the planets. Thus venus was obſerved to have ſeveral by ſignior Blanchini, in the year 1726. As in venus, ſo in mars both dark and bright ſpots have been obſerved, firſt by Galileo, and afterwards by Caſſini, &c. Jupiter has had his ſpots obſervable ever ſince the invention and uſe of large teleſcopes. Saturn, by reaſon of his great diſtance on one hand, and mercury, by reaſon of his ſmalneſs and vicinity to the ſun on the other, have not as yet had any ſpots diſcovered on their ſurfaces, and conſequently nothing in relation to their diurnal motions and inclinations of their axis to the planes of their orbits can be known, which circumſtances are determined in all the other planets, as well as in the ſun, by means of theſe maculæ. See the articles VENUS, MARS, and JUPITER.

The ſpots, or maculæ, obſervable on the moon's ſurface, ſeem to be only cavities or large caverns on which the ſun ſhining very obliquely, and touching only their upper edge with his light, the deeper places remain without light; but as the ſun riſes higher upon them, they receive more light, and the ſhadow, or dark parts, grow ſmaller and ſhorter, till the ſun comes at laſt to ſhine directly upon them, and then the whole cavity will be illuſtrated: but the dark, duſky ſpots, which continue always the ſame, are ſuppoſed to proceed from a kind of matter or ſoil which reflects leſs light than that of the other regions. See MOON.

MAD-APPLE, a name given by ſome to the ſolanum. See the article SOLANUM.

MAD-WORT, *alyſſon*, in botany. See the article ALYSSON.

MADAGASCAR, or *St.* LAURENCE, an iſland of Africa, ſituated between 43° and 51° of eaſt longitude, and between 12° and 26° ſouth latitude; three hundred miles ſouth-eaſt of the continent of Africa. It is about a thouſand miles in length from north to ſouth, and generally between two and three hundred miles broad. The country is divided among a great number of petty ſovereigns.

MADDER, in commerce, is the root of the rubia-plant, for the characters of which, ſee the article RUBIA.

It is one of the long and ſmall roots, diſtinguiſhable from all others by its remarkable red colour, and firm texture; its ſurface is wrinkled, and in the thickeſt part it ſeldom exceeds the bigneſs of a gooſe-quill. It has very little ſmell; but it has a remarkable taſte, it being a mixture of ſweet and bitter, together with a manifeſt aſtringency.

Madder is cultivated in vaſt quantities in ſeveral parts of Holland; the Dutch ſupply all Europe with it, and make a great advantage by trading in it. What they ſend over, for the uſe of the dyers, is ground into a coarſe powder, of which there are two kinds: the one is the whole root ground, and the other is that which is firſt cleaned from the cortical part, and then ground to a powder; this laſt is of a paler and more agreeable colour.

This root is an attenuant, and has the credit of being a vulnerary of the firſt rank. It is given in chronic caſes, where there are obſtructions of the viſcera. It promotes the menſes and urine; and is good in jaundices, dropſies, and obſtructions of the ſpleen. Its doſe is from five grains to fifteen; but it is ſeldom given ſingly. It frequently makes an ingredient in infuſions and decoctions, among medicines of the ſame intention, and gives them an elegant colour.

It is uſed in great quantities by the dyers, for dying red and other colours: and may be made into a lake, in the ſame manner as braſil. See *Artificial* LACCA.

MADERAS, ſome iſlands ſituated in the Atlantic ocean, three hundred miles weſt of Sallee, in Africa, in 16° weſt longit. and between 32° and 33° of north lat. The largeſt of them, called Madera, or rather Mattera, by the Portugueſe, is about an hundred and twenty miles in circumference, and produces incredible quantities of wine, which has the peculiar quality of keeping beſt in hot climates, where other wines turn ſour.

MADNESS, *mania*, a moſt dreadful kind of delirium, without a fever.

Melancholy and madneſs may very juſtly be conſidered as diſeaſes nearly allied; for they have both the ſame origin, that is, an exceſſive congeſtion of blood in the brain: they only differ in degree, and with reſpect to the time of invaſion; melancholy being the primary diſeaſe, of which madneſs is the augmentation. Both theſe diſorders ſuppoſe a weakneſs of the brain, which may proceed from an hereditary diſpoſition; from violent diſorders of the mind, eſpecially long continued grief, ſadneſs, anxiety, dread, and terror; from cloſe ſtudy and intenſe application of mind to one ſubject; from narcotic and ſtupefying medicines; from pre-

vious diſeaſes, eſpecially acute fevers; from a ſuppreſſion of hæmorrhages, and omitting cuſtomary bleeding; from exceſſive cold, eſpecially of the lower parts, which forces the blood to the lungs, heart, and brain; and from violent anger, which will change melancholy into madneſs.

It is evident from obſervation, that the blood of maniac patients is black, and hotter than in the natural ſtate; that the ſerum ſeparates more ſlowly and in a leſs quantity than in healthy perſons; and that the excrements are hard, of a dark red or greyiſh colour, and the urine light and thin.

The antecedent ſigns of madneſs are a redneſs and ſuffuſion of the eyes with blood, a tremulous and inconſtant vibration of the eye-lids, a change of diſpoſition and behaviour; ſupercilious looks, a haughty carriage, diſdainful expreſſions, a grinding of the teeth, and unaccountable malice to particular perſons: alſo little ſleep, a violent head-ach, quickneſs of hearing, incredible ſtrength, inſenſibility of cold; and, in women, an accumulation of blood in the breaſts, in the increaſe of this diſorder.

Diſeaſes of the mind have ſomething in them ſo different from other diſorders, that they ſometimes remit for a long time, but return at certain periods, eſpecially about the ſolſtices. It may likewiſe be obſerved, that the raving fits of mad people, which keep the lunar periods, are generally accompanied with epileptic ſymptoms.

This diſeaſe, when it is primary or idiopathic, is worſe than the ſymptomatic, that accompanies the hyſteric or hypochondriac paſſion, which is eaſily cured; as is that alſo which ſucceeds intermitting fevers, a ſuppreſſion of the menſes, of the lochia, of the hæmorrhoids, or which is occaſioned by narcotics. When the paroxyſms are ſlight in the idiopathic kind, the cure is not very difficult; but if it is inveterate, and has but ſhort remiſſions, it is almoſt incurable. Sometimes this diſeaſe terminates by critical excretions of blood from the noſe, uterus, or anus: ſometimes diarrhœas and dyſenteries will terminate theſe diſorders; and puſtules, ulcers, and the itch have alſo done the ſame. As to the cure, bleeding is the moſt efficacious of all remedies; and where there is a redundance of thick grumous blood, a vein is to be firſt opened in the foot, a few days after in the arm; then in the jugular vein, or one in the noſtrils with a ſtraw; and laſt of all the frontal veins, with a blunt-lancet, for fear of hurting the pericranium. Tepid baths made of rain or river-water are alſo convenient; and before the patient enters the bath, he ſhould have cold water poured on his head. Purgatives are likewiſe uſeful; but the lenient are to be preferred to the draſtic: thus manna, caſſia, rhubarb, cream of tartar, or tartar vitriolate, are moſt convenient, when the diſeaſe ariſes from the hypochondriac paſſion, a ſtagnation of the blood in the inteſtines, or in the ramification of the vena portæ, eſpecially when taken in decoctions and infuſions at repeated intervals, ſo as to operate in an alterative manner. Some kinds of mineral waters are alſo highly efficacious in melancholy and madneſs: but nothing is better for removing the cauſe of theſe diſorders, than depurated mercury. Particular medicines among vegetables, are baum, betony, vervain, brook-lime, ſage, wormwood, flowers of St. John's wort, of the lime tree, and camphire: from animals, aſs's blood: among minerals, ſteel, cinnabar, ſugar of lead, and the calx and tincture of ſilver. Hoffman is of opinion, that nothing better deſerves the name of a ſpecific in theſe diſeaſes than motion and exerciſe, when duly proportioned to the ſtrength of the body. Sedative medicines are good, but not opiates and narcotics, for theſe induce ſtupidity and folly: thoſe that are good in an epilepſy, will be here beneficial, ſuch as caſtor, ſhavings of hart's horn, the roots and ſeeds of piony; antiepileptic powders, the valerian-root, flowers of the lily of the valley and of the lime-tree. Boerhaave ſays, the principal remedy for raving madneſs, is dipping in the ſea, and keeping the patient there as long as he can bear it. As a high degree of the itch has terminated theſe diſorders, it may be proper to make iſſues in the back: but bliſters (contrary to Shaw's opinion) are prejudicial; for by ſtimulating the nervous membranes and the dura mater, they increaſe the ſpaſmodic ſtricture, and the motion of the groſs and bilious blood through the head and the other parts of the body.

As to diet, the patient ſhould carefully abſtain from ſalt and ſmoked fleſh, whether beef or pork; from ſhell-fiſh; from fiſh of a heavy and noxious quality; from aliments prepared with onions and garlic: all which generate a thick blood. He ſhould, in general, eat no more than

is

is ſufficient to ſupport nature. Small beer, or cold pure water, are the beſt drink; but ſweet and ſtrong wines are highly prejudicial, as is alſo exceſſive ſmoaking tobacco. Change of air and travelling may be beneficial.

For the madneſs proceeding from the bite of a mad dog, ſee HYDROPHOBIA.

MADRAS, a town on the coaſt of Cormandel, inhabited by blacks, and ſituated juſt without the walls of the White-town of Fort St. George. This town has been ſurrounded by a ſtone wall by governor Pitt.

MADRE DE POPA, a town and convent of Terra Firma, in South America, ſituated on the river Grande, fifty miles eaſt of Carthagena, almoſt as much reſorted to by the pilgrims of America, as the chapel of Loretto is by the pilgrims of Europe: weſt long. 76°, north lat. 11°.

MADREPORA, in botany, a genus of ſubmarine plants, of a ſtony hardneſs, but ſomewhat approaching to the form of other vegetables. It is compoſed of a main ſtem, and ſubdivided into a number of branches, which are full of holes or pores, in a radiated form. See plate CLXX. fig. 1.

MADRID, the capital of the province of New Caſtile, and of the whole kingdom of Spain: weſt long. 4° 15′, and north lat. 40° 30′.

It is ſituated almoſt in the middle of a large ſandy plain, ſurrounded with high mountains: it is about ſeven miles in circumference, and contains ſeveral grand ſtreets and ſpacious ſquares; it has alſo three royal palaces, called the Palace Royal, the Caſo del Campo, and the Buen Retiro.

MADRIER, in the military art, a long and broad plank of wood, uſed for ſupporting the earth in mining and carrying on a ſap, and in making coffers, caponiers, galleries, and for many other uſes at a ſiege. Madriers are alſo uſed to cover the mouths of petards, after they are loaded, and are fixed with the petards to the gates or other places deſigned to be forced open.

MADRIGAL, in the italian, ſpaniſh, and french poetry, is a ſhort amorous poem, compoſed of a number of free and unequal verſes, neither confined to the regularity of a ſonnet, nor to the point of an epigram, but only conſiſting of ſome tender and delicate thought, expreſſed with a beautiful, noble, and elegant ſimplicity. The madrigal is uſually conſidered as the ſhorteſt of all the leſſer kinds of poetry, except the epigram: it will admit of fewer verſes than either the ſonnet or the roundelay; no other rule is regarded in mingling the rhimes, and the different kinds of verſe, but the fancy and convenience of the author: however this poem allows of leſs licence than many others, both with reſpect to rhime, meaſure, and delicacy of expreſſion.

MADRIGAL, in geography, a city of the province of Popayan, in South America: weſt long. 75° 30′, and north lat. 30′,

MADURA, the capital of a province of the ſame name in the hither India: eaſt long. 77°, and north lat. 10°.

MÆMACTERION, μαιμακτηριων, in antient chronology, the fourth month of the athenian year, conſiſting of only twenty-nine days, and anſwering to the latter part of September and the beginning of October.

MÆNA, in ichthyology, the variegated ſparus, with a black ſpot in the middle of the ſide, and with four large teeth. See the article SPARUS.

MAES, a river which ariſes in Burgundy, and runs through Lorrain and Champaign into the Netherlands, and at laſt, after paſſing by many conſiderable towns, diſcharges itſelf into the German ſea, a little below the Briel.

MAESTRICHT, a town in the province of Brabant, ſituated on the river Maes, thirteen miles north of Liege: eaſt long. 5° 40′, and north lat. 50° 55′.

MAESYCK, a town of Germany, in the biſhopric of Liege, ſixteen miles north-eaſt of Maeſtricht.

MAGADOXA, the capital of the territory of the ſame name, at the mouth of the river Magadoxa, on the coaſt of Anian, in Africa: eaſt longit. 41°, and north lat. 2°.

MAGAS, in antient muſic, the name of two inſtruments, the one a ſtringed kind, and the other a kind of flute, which is ſaid to have yielded very high and very low ſounds at the ſame time.

Magas alſo ſignifies the bridge of any inſtrument.

MAGAZINE, a place in which ſtores are kept, of arms, ammunition, proviſions, &c. Every fortified town ought to be furniſhed with a large magazine, which ſhould contain ſtores of all kinds, ſufficient to enable the garriſon and inhabitants to hold out a long ſiege, and in which ſmiths, carpenters, wheelwrights, &c. may be employed, in making every thing

thing belonging to the artillery, as carriages, waggons, &c.

MAGDALEN, or *Nuns of St.* MAGDALEN, an order of religious in the romiſh church, dedicated to St. Mary Magdalen, and ſometimes called magdalenettes. Theſe chiefly conſiſt of courtezans, who quitting their profeſſion, devote the reſt of their lives to repentance and mortification.

MAGDEBURG, the capital of the dutchy of the ſame name, ſituated on the river Elbe, ſeventy miles weſt of Berlin: eaſt long. 12°, and north. lat. 52° 15′.

MAGDELENA, a large river of South America, which, riſing near the equator, runs north thro' Terra Firma, and uniting its waters with the river Cance, obtains the name of the river Grande, and falls into the north ſea, below the town of Madre de Popa.

MAGELLAN STREIGHTS, or rather *Streights of* MAGELLAN. Theſe ſtreights are about three hundred miles in length from the Atlantic to the Pacific ocean, but of a very unequal breadth; and were at firſt diſcovered and paſſed by Ferdinand Magellan, from whom they had their name: they are ſituated between the iſland Terra del Fuego and the moſt ſouthern part of the continent of America, between 76° and 84° of weſt longitude, and between 52° and 54° of ſouth lat.

Lake of MAGGIORE, is ſituated partly in the dutchy of Milan, and partly in the country of the Griſons: this lake is thirty-five miles long, and ſix broad.

MAGI, or MAGIANS, an antient religious ſect in Perſia, and other eaſtern countries, who maintained, that there were two principles, the one the cauſe of all good, the other the cauſe of all evil; and abominating the adoration of images, worſhipped God only by fire, which they looked upon as the brighteſt and moſt glorious ſymbol of Oromaſdes, or the good God; as darkneſs is the trueſt ſymbol of Arimanius, or the evil god. This religion was reformed by Zoroaſter, who maintained that there was one ſupreme independent being; and under him two principles or angels, one the angel of goodneſs and light, and the other of evil and darkneſs: that there is a perpetual ſtruggle between them, which ſhall laſt to the end of the world; that then the angel of darkneſs and his diſciples ſhall go into a world of their own, where they ſhall be puniſhed in everlaſting darkneſs; and the angel of light and his diſciples ſhall alſo go into a world of their own, where they ſhall be rewarded in everlaſting light. See the article ZEND.

The prieſts of the magi were the moſt ſkilful mathematicians and philoſophers of the ages in which they lived, inſomuch that a learned man and a magian became equivalent terms. The vulgar looked on their knowledge as more than natural, and imagined them inſpired by ſome ſupernatural power: and hence thoſe who practiſed wicked and miſchievous arts, taking upon themſelves the name of magians, drew on it that ill ſignification which the word magician now bears among us.

This ſect ſtill ſubſiſts in Perſia, under the denomination of gaurs, where they watch the ſacred fire with the greateſt care, and never ſuffer it to be extinguiſhed. See the article GAURS.

MAGIC, originally ſignified only the knowledge of the more ſublime parts of philoſophy; but as the magi likewiſe profeſſed aſtrology, divination, and ſorcery, the term magi became odious, being uſed to ſignify an unlawful diabolical kind of ſcience, acquired by the aſſiſtance of the devil and departed ſouls. See the articles ASTROLOGY, DIVINATION, NECROMANCY, &c.

Natural magic is only the application of natural philoſophy to the production of ſurpriſing but yet natural effects. The common natural magic, found in books, gives us only ſome childiſh and ſuperſtitious traditions of the ſympathies and antipathies of things, or of their occult and peculiar properties; which are uſually intermixed with many trifling experiments, admired rather for their diſguiſe than for themſelves. See the article EXPERIMENTAL PHILOSOPHY.

MAGIC LANTERN, in optics. See the article LANTERN.

MAGIC SQUARE, in arithmetic, a ſquare figure made up of numbers in arithmetical proportion, ſo diſpoſed in parallel and equal ranks, that the ſums of each row taken either perpendicularly, horizontally, or diagonally, are equal: thus,

Natural ſquare.

1	2	3
4	5	6
7	8	9

Magic ſquare.

2	7	6
9	5	1
4	3	8

Magic ſquares ſeem to have been ſo called from their being uſed in the conſtruction of taliſmans.

MAGISTERY, in chemiſtry, a very fine powder

powder made by ſolution and precipitation. Of theſe there are three kinds mentioned by Quincy, the magiſtery of antimony, of biſmuth, and of calamine. 1. The magiſtery of antimony is made thus: take of antimony, in very fine powder, four ounces; put it into a large matraſs, pour upon it one pound of aqua regia, by four ounces at a time; ſet it upon a ſand-heat, in a chimney, that the fumes may aſcend without offence: let it ſtand in a heat of digeſtion ten or twelve hours, ſhaking it once in two or three hours; then let it cool, and put to it a gallon of ſpring-water, which pour off before it ſettles; put to it more water, ſtir it, and pour it to the other before it ſettles: repeat this operation till nothing remains in the matraſs but a yellow powder, which is the combuſtible ſulphur of antimony: let the white powder ſettle, and decant the water, till by ſeveral ablutions the magiſtery becomes inſipid: then dry, and keep it for uſe. This is given in apoplexies, palſies, and all nervous and hypochondriacal diſtempers: its doſe is from five to fifteen grains. 2. Magiſtery of biſmuth is made thus; take ſpirit of nitre, one pound; and add to it as much powder of biſmuth as it is capable of diſſolving; then diſſolve four ounces of common ſalt in two gallons of water; filter it, and pour into it the diſſolution of biſmuth, when it will turn milky, and let fall a precipitate: when it is ſettled, pour off the water from the magiſtery; add more freſh water, and continue the ablutions till the magiſtery becomes inſipid; then dry it gently for uſe. 3. Magiſtery of calamine is thus made: take calamine, in fine powder, four ounces; put it into a matraſs, and pour upon it ſpirit of ſalt, one pound; let them digeſt upon warm ſand, forty-eight hours; filter the diſſolution, and precipitate the magiſtery with ſpirit of urine; free it from its ſalt by ſeveral ablutions, and dry it gently for uſe.

MAGISTRATE, any public officer to whom the executive power of the law is committed, either wholly, or in part.

MAGNA ASSISA ELIGENDA, is a writ antiently directed to the ſheriff for ſummoning four lawful knights before the juſtices of aſſiſe, in order to chooſe twelve knights of the neighbourhood, &c. to paſs upon the great aſſiſe between ſuch a perſon plaintiff, and ſuch a one defendant.

MAGNA CHARTA, the great charter of the liberties of England, and the baſis of our laws and privileges.

This charter may be ſaid to derive its origin from king Edward the Confeſſor, who granted ſeveral privileges to the church and ſtate, by charter: theſe liberties and privileges were alſo granted and confirmed by king Henry I. by a celebrated great charter, now loſt; but which was confirmed or re-enacted by king Henry II. and king John. Henry III, the ſucceſſor of this laſt prince, after having cauſed twelve men to make enquiry into the liberties of England in the reign of Hen. I. granted a new charter, which was the ſame as the preſent magna charta; this he ſeveral times confirmed, and as often broke; till in the thirty-ſeventh year of his reign, he went to Weſtminſter-hall, and there, in the preſence of the nobility and biſhops, who held lighted candles in their hands, magna charta was read, the king all the while holding his hand to his breaſt, and at laſt ſolemnly ſwearing faithfully and inviolably to obſerve all the things therein contained, &c. then the biſhops extinguiſhing the candles, and throwing them on the ground, they all cried out, "Thus let him be extinguiſhed, and ſtink in hell, who violates this charter." It is obſerved, that notwithſtanding the ſolemnity of this confirmation, king Henry, the very next year, again invaded the rights of his people, till the barons entered into a war againſt him, when, after various ſucceſs, he confirmed this charter, and the charter of the foreſt, in the fifty-ſecond year of his reign. This excellent charter, ſo equitable and beneficial to the ſubject, is the antienteſt written law in the kingdom: by the 25 Edw. I. it is ordained, that it ſhall be taken as the common law; and by the 43 Edward III. all ſtatutes made againſt it are declared to be void.

MAGNES ARSENICALIS, ARSENICAL MAGNET. See the article ARSENIC.

MAGNESIA, MANGANESE, in natural hiſtory. See the article MANGANESE.

MAGNET, or LOADSTONE, *magnes*, in natural hiſtory, a very rich iron ore, found in large detached maſſes, of a duſky iron-grey, often tinged with browniſh or reddiſh, and when broken appearing ſomething like the common emery, but leſs ſparkling. It is very heavy, conſiderably hard, of a perfectly irregular and uneven ſurface, and of a firm ſtructure, but uſually with ſome porous

porous irregularities within. It is found in England, and all other places where there are iron mines.

The primary properties of the loadſtone are the following: 1. Every loadſtone has two points, called poles, which emit the magnetic virtue. 2. One of theſe poles attracts, the other repels iron, but no other body. 3. This virtue, being the third ſpecies of attraction, is communicated to iron very copiouſly by the touch, which renders it ſtrongly magnetic. 4. A piece of iron ſo touched by the loadſtone, and nicely ſuſpended on a ſharp point, will be determined to ſettle itſelf in a direction nearly north and ſouth. 5. The end of the needle touched by the ſouth pole of the ſtone, will point northwards; and the contrary. 6. Needles touched by the ſtone, will dip below the horizon, or be directed on the touched part to a point within the earth's ſurface: this is called the dipping needle. 7. This virtue may alſo be communicated to iron by a ſtrong attrition all one way. 8. Iron-rods or bars acquire a magnetic virtue by ſtanding long in one poſition. 9. Fire totally deſtroys this virtue, by making the ſtone or iron red-hot. 10. This power is exerted ſenſibly to the diſtance of ſeveral feet. 11. It is ſenſibly continued through the ſubſtance of ſeveral contiguous bodies or pieces of iron. 12. It pervades the pores of the hardeſt body. And, 13. Equally attracts the iron in vacuo as in open air. Theſe and many more are the properties of a body, not more wonderful than uſeful to mankind. See POLE, NEEDLE, VARIATION, &c.

There is a very curious method of rendering viſible the directions which the magnetic effluvia take in going out of the ſtone: thus, let AB, CD, (pl. CLXV. fig. 5.) be the poles of the ſtone; about every ſide gently ſtrew ſome ſteel-filings on a ſheet of white paper; theſe ſmall particles will be affected by the effluvia of the ſtone, and ſo poſited as to ſhew the courſe and direction of the magnetic particles on every part: thus, in the middle of each pole, between AB and CD, it appears to go nearly ſtraight on; towards the ſides it proceeds in lines more and more curved, till at laſt the curved lines from both poles meeting and coinciding, form numberleſs curves on each ſide, nearly of a circular figure, as repreſented in the diagram. This ſeems to ſhew that the magnetic virtue emitted from each pole, circulates to, and enters the other. The law of magnetic attraction ſeems not yet aſcertained. Sir Iſaac Newton ſuppoſes it to decreaſe nearly in the triplicate ratio of the diſtance; but Dr. Helſham trying the experiment with his loadſtone found it to be as the ſquares of the diſtances inverſely; and Mr. Martin aſſures us, that the power of his loadſtone decreaſes in a different manner from either, it being in the ſeſquiplicate ratio of the diſtances inverſely. For exactneſs, he made a ſquare bar of iron juſt a quarter of an inch thick, and then provided three pieces of wood of the ſame form and thickneſs exactly; then poiſing the loadſtone very nicely at the end of a balance, which would turn with leſs than a grain, he placed under it the iron, with firſt one piece of wood, then two pieces, and laſtly all three pieces upon it; by which means the ſteel-points of the pole were kept at $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, of an inch from the iron; and in thoſe diſtances the weights put into the oppoſite ſcale, to raiſe the loadſtone from the wood (which is touched while the beam was horizontal) were as follow

Diſt.	Grains.	Ratio of the ſq.	Ratio of the cubes.	Seſqui ratio
$\frac{1}{4}$	156	156	156	156
$\frac{1}{2}$	58	39	19	58
$\frac{3}{4}$	28	17	6	30

Whence it appears that the number of grains to counteract the power of the loadſtone in theſe diſtances; approach very near, and are almoſt the ſame with thoſe which are in the ſeſquiplicate ratio but are widely different from thoſe which are in the duplicate or triplicate ratio and this experiment Mr. Martin tried ſeveral times for each diſtance, with ſcarce any variation in the ſucceſs.

The ingenious Muſchenbroek has, with indefatigable pains and application, made experiments of the attractions and repulſions of loadſtones in reſpect to iron and to each other, but could never find any regular proportion in the increaſe of attraction in their approach to, or decreaſe of attraction in their receſs from one another; only that the force of the magnetic virtue did increaſe in the approach and diminiſh in the receſs from the ſtone but not exactly as the diſtance, nor as the ſquare or cube of the diſtance, nor as the ſquare or cube of the diſtance reciprocally; nor in any proportion reducible to numbers; and therefore he very reaſonably conjectures, that the repulſi

and attractions disturb one another, so as to confound the proportion: nor are we able to hope for any other rule concerning this matter, till a way be found, if ever it can be, of separating the attracting from the repelling parts.

The power or force of magnets is generally greater in small than in large ones, in proportion to their bulk. It is very rare that very large ones will take up more than three or four times their own weight, but a small one is but tolerably good that will take up no more than eight, ten, or twelve times its weight. The honourable Mr. Berkeley has one whose weight is but 43 grains, which will take up 1032 grains, which is 24 times its weight; but that of Mr. Newton, which he wears in his ring, weighing scarcely three grains, will take up 746 grains, or 250 times its weight.

The poles of a loadstone are not to be looked upon as two such invariable points as never to change place; for according to Mr. Boyle, the poles of a little bit of magnet may be changed by applying them to the more vigorous poles of another, as has been confirmed by Dr. Knight, who could change at pleasure the poles of a natural magnet, by means of iron-bars magnetically impregnated. Upon gently cutting a magnet through the middle of its axis, each piece becomes a complete magnet; for the parts that were contiguous under the equator before the magnet was cut, become poles, and even poles of different names; so that each piece may become equally a north or south pole, according as the section was made nearer the south or north pole of the large magnet; and the same thing would happen in any other sub-divisions. But upon cutting a magnet longitudinally, there will then be four poles, the same as before the cutting; only that there shall be formed in each piece a new axis parallel to the former, and more or less in the inside of the magnet. We find by experience, that two magnets attract each other by the poles of different denominations; whereas, on the contrary, the two similar poles repel each other. The attraction of a magnet newly dug out of a mine, makes it take up only very small pieces of iron; for which reason it must be armed, in order to augment its force: besides this, the arming it unites, directs, and condenses its virtue towards its poles, and causes its emanations to tend entirely towards the mass which is laid thereon.

When you have determined where the poles are, which you may exactly find by placing over the magnet a very fine short needle, which will stand perpendicular over each pole, and no where else; then you must file it very smooth at its poles, so that the axis shall have the greatest length, yet without too much diminishing its other dimensions. To determine the proportions of the armour, the greater the force of the magnet is, the thicker must the pieces of steel be of which it is to consist; and for this purpose try the magnet with several steel-bars, and the greater weight it takes up with a steel-bar on, that bar is to be its armour. Though the attraction of an armed magnet appears considerable, yet very weak causes destroy its effect in a moment; for instance, when an oblong piece of iron is attracted under the pole of an excellent magnet, and the pole of a different denomination in another magnet that is weaker is presented to the lower end of this piece of iron, this weaker magnet will very strongly take away the iron. In like manner, if the point of a needle be put under one of the poles of a magnet so as to hang by its head, and present to this head any bar of iron by its upper end, the needle will immediately quit the magnet, in order to adhere to the bar; but if the needle hold by its head to the pole of the magnet, then neither the bar of iron nor a weak magnet shall disengage it; and there is another slight circumstance which makes an armed and vigorous loadstone appear to have no more force, and that is the too great length of the iron which is to be raised by one of the poles.

In order to communicate the magnetic virtue effectually, these methods are made use of. 1. It has been discovered, that iron rubbed upon one of the poles of the magnet, acquires a great deal more virtue than from any other part thereof, and this is more considerable from an armed than a naked magnet. 2. The more gently the iron is pressed, and the more it is pressed against the pole, the more magnetical it becomes. 3. It is more convenient to impregnate iron on one pole than on both successively. 4. The iron is much better impregnated by pressing it uniformly and in the same direction, according to its length, than by rubbing it by the middle; and the extre-

mity which touches the pole laſt, retains the moſt virtue. 5. A piece of poliſhed ſteel, or a bit of pointed iron, receives more virtue than a ſimple piece of iron of the ſame figure; and, *cæteris paribus*, a piece of iron that is long, ſmall, and pointed, is more ſtrongly impregnated than that of any other form.

The communication of the magnetic virtue, does not ſenſibly impair that of the loadſtone; though it has been obſerved, that ſome magnets have communicated a greater power to iron to raiſe weights, than they had themſelves, but without impairing their own force, or adding any thing to the weight of the iron.

As ſeveral ways have been propoſed for recovering the decayed virtue of loadſtones, but to little purpoſe (eſpecially that of keeping the ſtone conſtantly in ſteel-filings) we ſhall here relate the remarkable experiment of Mr. Haac for this purpoſe, as it was attended with great ſucceſs. This gentleman had a magnet weighing fourteen ounces and a half, armed, which would take up ſixteen times its own weight; but having laid it by for ſome years unuſed, it loſt one fourth part of its virtue, or more; whereupon he hung as much weight to the ſtone as it would ſuſtain, and ſo left it for ſome weeks; then returning, he applied more weight to the former, which it very eaſily bore, and then repeating the addition of more weight at ſeveral periods, in the ſpace of about two years, he found that the ſtone had not only recovered its former ſtrength, but increaſed it ſo far as that it would now take up more than twenty pounds, whereas at firſt it would not take up fifteen.

Artificial MAGNET, a ſteel-bar impregnated with the virtues of the magnet, ſo as to poſſeſs all the properties, and be uſed inſtead of the natural loadſtone.

There have been ſeveral methods propoſed for making artificial magnets, but none has yet met with greater ſucceſs than that of Mr. Canton, which is as follows: procure a dozen of bars, ſix of ſoft ſteel, each three inches long, one quarter of an inch broad, and one twentieth of an inch thick; with two pieces of iron, each half the length of one of the bars, but of the ſame breadth and thickneſs: alſo ſix pieces of hard ſteel, each five inches and a half long, half an inch broad, and three twentieths of an inch thick; with two pieces of iron of half the length, but the whole breadth and thickneſs of one of the hard bars: and let all the bars be marked with a line quite round them at one end. Then take an iron-poker and tongs, (plate CLXVI. fig. 1.) (or two bars of iron) the larger they are, and the longer they have been uſed, the better; and fixing the poker upright between the knees, hold to it, near the top, one of the ſoft bars, having its marked end downwards, by a piece of ſewing ſilk, which muſt be pulled tight by the left hand, that the bar may not ſlide: then graſping the tongs with the right hand, a little below the middle, and holding them nearly in a vertical poſition, let the bar be ſtroked by the lower end from the bottom to the top about ten times on each ſide, which will give it a magnetic power ſufficient to lift a ſmall key at the marked end; which end, if the bar was ſuſpended on a point, would turn towards the north, and is therefore called the north pole, and the unmarked end is for the ſame reaſon called the ſouth pole. Four of the ſoft bars being impregnated after this manner, lay the other two (*ibid.* fig. 2.) parallel to each other, at the diſtance of one fourth of an inch, between the two pieces of iron belonging to them, a north and a ſouth pole againſt each piece of iron: then take two of the four bars already made magnetical, and place them together ſo as to make a double bar in thickneſs, the north pole of one even with the ſouth pole of the other, and the remaining two being put to theſe, one on each ſide, ſo as to have two north and two ſouth poles together, ſeparate the north from the ſouth poles at one end by a large pin, and place them perpendicularly with that end downward on the middle of one of the parallel bars, the two north poles towards its ſouth, and the two ſouth poles towards its north end: ſlide them backward and forward three or four times the whole length of the bar, and removing them from the middle of this, place them on the middle of the other bar as before directed, and go over that in the ſame manner; then turn both the bars the other ſide upwards and repeat the former operation: this being done, take the two from between the pieces of iron, and placing the two outermoſt of the touching bars in their room, let the other two be the outermoſt of the four to touch theſe with; and the proceſs being repeated till each pair of bars have been touched three or four times

over

BRITISH MUSEUM

The Method of making Artificial MAGNETS

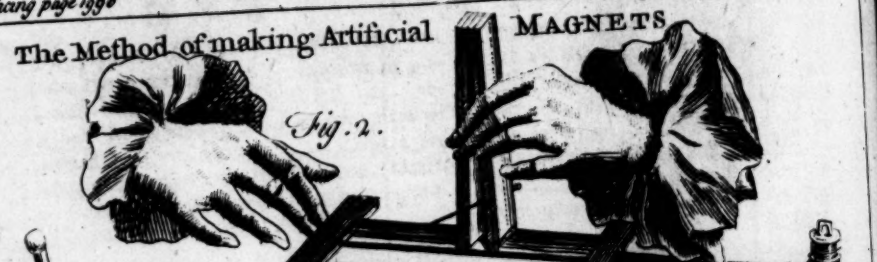


Fig. 2.

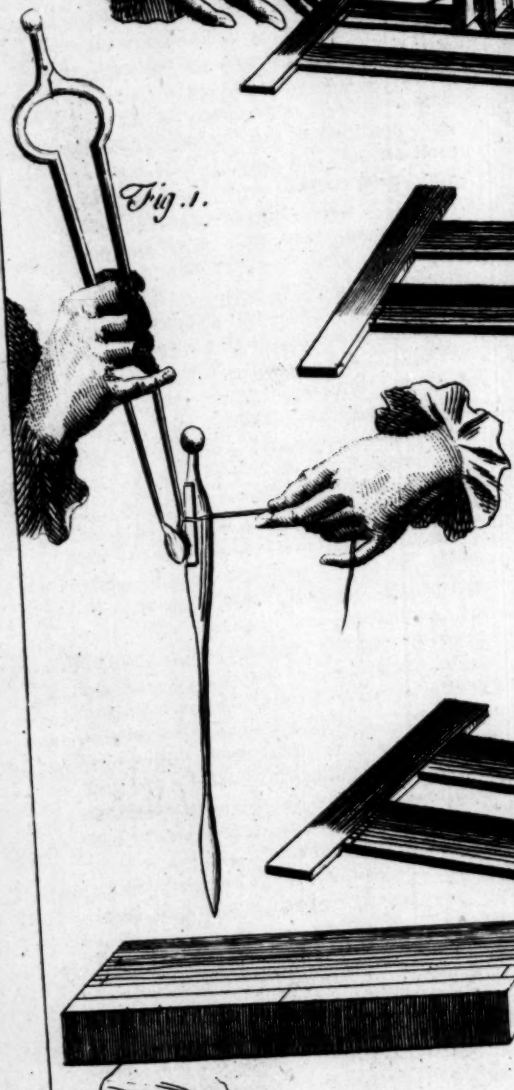


Fig. 1.

Fig. 3.

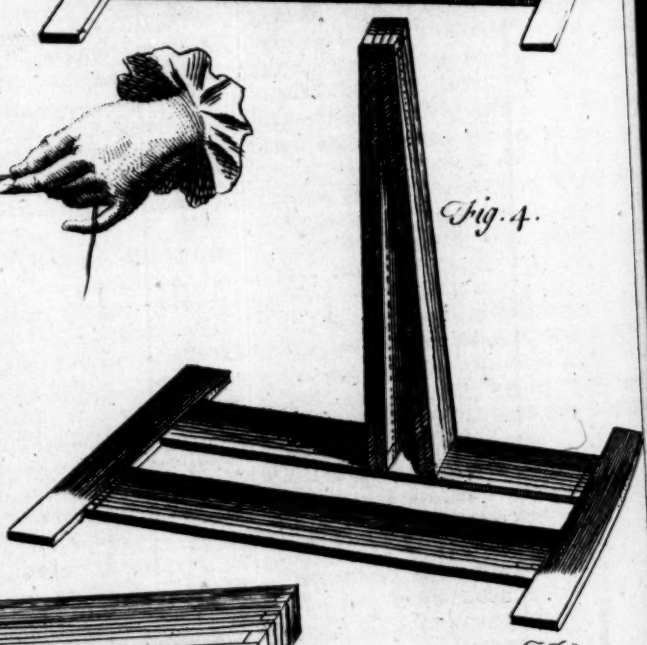


Fig. 4.

Fig. 6.

Fig. 5.

T. Jefferys sculp.

over, which will give them a conſiderable magnetic power, put the half dozen together after the manner of the four, (*ibid.* fig. 3.) and touch with them two pair of the hard bars placed between their irons, at the diſtance of about half an inch from each other; then lay the ſoft bars aſide, and with the four hard ones, let the other two be impregnated, (*ibid.* fig. 4.) holding the touching bars apart at the lower end near two tenths of an inch, to which diſtance let them be ſeparated after they are ſet on the parallel bar, and brought together again before they are taken off; this being obſerved, proceed according to the method deſcribed above, till each pair have been touched two or three times over: but as this vertical way of touching a bar will not give it quite ſo much of the magnetic virtue as it will receive, let each pair be now touched once or twice over in their parallel poſition between the irons (*ibid.* fig. 5.) with two of the bars held horizontally, or nearly ſo, by drawing at the ſame time the north of one from the middle over the ſouth end, and the ſouth of the other from the middle over the north end of a parallel bar; then bringing them to the middle again, without touching the parallel bar, give three or four of theſe horizontal ſtrokes to each ſide. The horizontal touch after the vertical, will make the bars as ſtrong as they poſſibly can be made, as appears by their not receiving any additional ſtrength, when the vertical touch is given by a great number of bars, and the horizontal by thoſe of a ſuperior magnetic power. This whole proceſs may be gone through in about half an hour; and each of the large bars, if well hardened, may be made to lift twenty-eight troy ounces, and ſometimes more. And when theſe bars are thus impregnated, they will give to an hard bar of the ſame ſize its full virtue in leſs than two minutes; and therefore will anſwer all the purpoſes of magnetiſm in navigation and experimental philoſophy much better than the loadſtone, which is known not to have a ſufficient power to impregnate hard bars. The half dozen being put into a caſe (*ibid.* fig. 6) in ſuch a manner as that two poles of the ſame denomination may not be together, and their irons with them as one bar, they will retain the virtues they have received: but if their power ſhould, by making experiments, be ever ſo far impaired, it may be reſtored without any foreign aſſiſtance in a few minutes. And if, out of curioſity, a much larger ſet of bars ſhould be required, theſe will communicate to them a ſufficient power to proceed with, and they may in a ſhort time, by the ſame method, be brought to their full ſtrength.

MAGNIFYING, in philoſophy, the making of objects appear larger than they would otherwiſe do; whence convex lenſes, which have the power of doing this, are called magnifying glaſſes; and of ſuch glaſſes are microſcopes conſtructed. See LENS and MICROSCOPE.

MAGNITUDE, whatever is made up of parts locally extended, or that hath ſeveral dimenſions; as a line, ſurface, ſolid, *&c.* See the article LINE, *&c.*

The apparent magnitude of a body is that meaſured by the viſual angle, formed by rays drawn from its extremes to the center of the eye; ſo that whatever things are ſeen under the ſame or equal angles, appear equal; and, *vice verſa.* Mr. Mac Laurin obſerves, that geometrical magnitudes may be uſefully conſidered as generated or produced by motion. Thus, lines may be conceived as generated by the motion of points; ſurfaces, by the motion of lines; ſolids, by the motion of ſurfaces; angles may be ſuppoſed to be generated by the rotation of their ſides. Geometrical magnitude is always underſtood to conſiſt of parts; and to have no parts, or to have no magnitude, are conſidered as equivalent in this ſcience. There is, however, no neceſſity for conſidering magnitude as made up of an infinite number of ſmall parts; it is ſufficient that no quantity can be ſuppoſed to be ſo ſmall, but it may be conceived to be farther diminiſhed; and it is obvious, that we are not to eſtimate the number of parts that may be conceived in a given magnitude, by thoſe which, in particular determinate circumſtances, may be actually perceived in it by ſenſe, ſince a greater number of parts become ſenſible, by varying the circumſtances in which it is perceived.

For the different magnitudes of the fixed ſtars, ſee the article STAR.

MAGNOLIA, the LAUREL-LEAVED TULIP TREE, in botany, a genus of the polyandria-polygamia claſs of plants; the corolla of which conſiſts of nine oblong, hollow, and obtuſe petals, narroweſt toward the baſe: the fruit is an oval ſtrobilus, compoſed of compreſſed, roundiſh, acute, and cluſtered capſules, which are

unilocular, and contain a ſingle kidney-ſhaped ſeed.

Could this beautiful tree be ſo far naturalized as to endure the cold of our ſevere winters, it would make one of the greateſt ornaments of our gardens. It is propagated by ſeeds, which ſhould be procured from Carolina.

MAGPY, in ornithology, a ſpecies of corvus, with a cuneiform tail. See the article CORVUS.

This is a very well known bird, and when in full feather, and in its wild ſtate, has a great deal of beauty; the ſize is about that of the jack-daw; but its variegated wings and length of tail make it ſeem longer.

MAHOMETANS, thoſe who believe and practiſe the religion of Mahomet.

The fundamental poſition on which Mahomet erected the ſuperſtructure of his religion, was, that there has been from the beginning of the world but one true orthodox belief, which conſiſts in acknowledging one only true God, and obeying ſuch of his meſſengers and prophets as he has from time to time ſent into the world, to reveal his will to mankind. Upon this foundation he ſet up for a prophet to extirpate idolatry, which was the religion of the Arabs, his countrymen, and to reform the other abuſes crept into religion. The whole ſubſtance of his doctrine he therefore comprehended in theſe two principal articles of faith, "There is but one God, and "Mahomet is his prophet;" in conſequence of which laſt article, all ſuch ordinances and inſtitutions as he thought fit to eſtabliſh, were to be received as obligatory and of divine authority.

The mahometans divide their religion into two general parts, faith and practice; of which the firſt is divided into ſix diſtinct branches; belief in God, in his angels, in his ſcriptures, in his prophets, in the reſurrection and final judgment, and in God's abſolute decrees. The points relating to practice are, prayer, with waſhings, &c. alms, faſting, pilgrimage to Mecca, and circumciſion. In regard to theſe practical points, Mahomet, it is ſaid, declared, that the practice of religion is founded upon cleanlineſs, which is one half of faith and the key of prayer. Alms-giving is thought to be ſo pleaſing in the ſight of God, that the caliph Omar Ebn Abdalaziz uſed to ſay, prayer carries us half way to God; faſting brings us to the door of his palace; and alms procure us admiſſion: and Mahomet himſelf uſed to ſay of faſting, that it was the gate of religion; and the odour of the mouth of him who faſteth is more grateful to God, than that of muſk. Beſides theſe they have ſome negative precepts and inſtitutions of the koran, in which ſeveral things are prohibited, as uſury, the drinking of wine, all games that depend upon chance, the eating of blood and ſwine's fleſh, and whatever dies of itſelf, is ſtrangled, or is killed by a blow or by another beaſt. Theſe doctrines and practices Mahomet eſtabliſhed by the ſword, by preaching, and by the alcoran or koran, which contains the principles of his religion; and he and his followers met with ſuch ſucceſs, as in a few years to ſubdue half the known world. See ALCORAN.

MAIDEN, an inſtrument uſed in Scotland for beheading criminals.

This is a broad piece of iron about a foot ſquare, very ſharp on the lower part, and loaded above with a very heavy weight of lead. At the time of execution it is pulled up to the top of a narrow wooden frame, about ten feet high, and as broad as the engine, with mouldings on each ſide for the maiden to ſlide in. A convenience is made about four feet from the ground, for the priſoner to lay his neck; and there is a kind of bar ſo faſtened as to keep him from ſtirring. The priſoner being thus ſecured, and the ſign given, the maiden is let looſe, which in a moment ſeparates his head from his body.

MAIDEN ASSIZE, an aſſize in which no perſon is condemned to die.

MAIDEN RENTS, was a noble formerly paid in ſome manors by a tenant to his lord, for his paſſing by the cuſtom of marcheta, by which he was to have the firſt night's lodging with his tenant's wife: tho' it is thought to ſignify a fine paid for a licence to marry a daughter.

MAIDENHEAD, a market-town in Berkſhire, twelve miles north-eaſt of Reading.

MAIDSTONE, the county town of Kent, ſituated on the Medway, twenty-two miles weſt of Canterbury; eaſt long. 1° north lat. 51° 20′. It ſends two members to parliament.

MAJESTY, a title given to kings, which frequently ſerves as a term of diſtinction. Thus the emperor is called ſacred majeſty, imperial majeſty, and cæſarian majeſty; the king of France is called moſt chriſtian majeſty, and when he treats with

with the emperor, the word ſacred is added; and the king of Spain is termed his moſt catholic majeſty: with reſpect to other kings, the name of the kingdom is added, as his britannic majeſty, his poliſh majeſty, *&c.* Formerly princes were more ſparing in giving titles, and more modeſt in claiming them; before the reign of Charles V. the kings of Spain had only the title of highneſs; and before that of Henry VIII. the kings of England were only addreſſed under the title of grace and highneſs.

MAIL, or *coat of* MAIL, a piece of defenſive armour for the body, made of ſmall iron rings, interwoven in the manner of a net.

Black MAIL, in our old cuſtoms. See the article ALBA FIRMA.

MAIM, MAIHEM, or MAYHEM, in law, a wound by which a perſon loſes the uſe of a member that might have been a defence to him, as when a bone is broken, a foot, hand, or other member cut off; or an eye put out; though the cutting off an ear or noſe, or breaking the hinder teeth, was formerly held to be no maim. A maim by caſtration was antiently puniſhed with death, and other maims with loſs of member for member: but afterwards they were only puniſhed by fine and impriſonment. It is now enacted, by the ſtatute of 22 and 23 Car. II. that if any perſon from malice aforethought, ſhall diſable any limb or member of any of the king's ſubjects with an intent to disfigure him, the offender, with his aiders and abettors, ſhall be guilty of felony without benefit of clergy; tho' no ſuch attainder ſhall corrupt the blood, or occaſion forfeiture of lands, *&c.*

MAINE, a river of Germany, which riſes on the eaſt ſide of the circle of Franconia, and running from eaſt to weſt, diſcharges itſelf into the Rhine at Mentz.

MAINE is alſo the north-weſt part of the province of Orleanois, in France.

MAINE is alſo a province of New England, bounded by Nova-Scotia, on the north-eaſt; by Maſſachuſets-bay, on the ſouth; and by the province of New Hampſhire, on the ſouth-weſt and north-weſt.

MAINLAND, the chief of the iſlands of Sherland, in the county of the Orcades in Scotland.

MAINPRISE, in law, is the receiving a perſon into friendly cuſtody, who might otherwiſe be committed to priſon, on ſecurity given that he ſhall be forth-coming at a certain time and place appointed. There is a difference between bail and mainpriſe, for a perſon mainpriſed is ſaid to be at large from the day of his being mainpriſed, till the day of his appearance, and is not liable to be confined by his ſureties: but when a perſon is let to bail by a judge, *&c.* till a certain day, he is in law always accounted in the ward of his bail during the time, and they may, if they pleaſe, keep him in priſon.

MAINTENANCE, in law, is an unlawful maintaining or ſupporting a ſuit between others, by ſtirring up quarrels, or interfering in a cauſe in which the perſon has no concern. Thus if any perſon diſintereſted in a cauſe officiouſly gives evidence, or opens the evidence in a ſuit, without being called upon for that purpoſe, or acts the part of counſel, by ſpeaking in the cauſe, or retains an attorney for the party, he is guilty of maintenance, and is liable to be proſecuted by indictment. It is no maintenance, where a perſon gives a poor man money out of charity to carry on a ſuit: and attorneys may lawfully diſburſe their money for their clients, in expectation of being paid again; but they muſt not do it at their own expence, on the condition of no purchaſe no pay.

MAJOR, in the art of war, the name of ſeveral officers of very different ranks and functions; as, 1. Major-general, the next officer to the lieutenant-general: his chief buſineſs is to receive the orders from the general, or in his abſence from the lieutenant-general of the day; which he is to diſtribute to the brigade-majors, with whom he is to regulate the guards, convoys, and detachments. When there are two attacks at a ſiege, he commands that on the left. He ought to be well acquainted with the ſtrength of each brigade, of each regiment in particular, and to have a liſt of all the field officers. In ſhort, he is in the army, what a major is in a regiment. He is allowed an aid de camp, and has a ſerjeant and fifteen men for his guard. 2. Major of a brigade, the officer who receives the orders from the major-general, and afterwards delivers them to the adjutants of the regiments at the head of the brigade; where he takes and marches the detachments, *&c.* to the general rendezvous. He ought to be an expert captain, to know the ſtate and condition of the brigade, and keep a roll of the colonels, lieutenant-colonels, majors, and adjutants. 3. Major of a regiment, the

next officer to the lieutenant-colonel, generally promoted from the oldeſt captain. He is to take care that the regiment be well exerciſed, to ſee it march in good order, and to rally it in caſe of its being broke. He is the only officer among the foot that is allowed to be on horſeback in time of action, that he may the more readily execute the colonel's orders, either in advancing or drawing off the regiment. 4. Major of a regiment of horſe, is the firſt captain, who commands in the abſence of the colonel. 5. Town-major, the third officer in a garriſon, being next to the deputy-governor. He ought to underſtand fortification, and hath charge of the guards, rounds, patrols, &c. His buſineſs is alſo to take care that the ſoldiers arms are in good order; he likewiſe orders the gates to be opened and ſhut, and gives the governor an account of all that paſſes within the place.

There are alſo aids-major, drums-major, &c. ſo called from their preheminence above others of the ſame denomination.

MAJOR, in law, a perſon who is of age to manage his own affairs. See the articles AGE and MINOR.

MAJOR, in logic, the firſt propoſition of a ſyllogiſm. See the article SYLLOGISM.

MAJOR and MINOR, in muſic, ſignify imperfect concords, which differ from each other by a ſemi-tone minor. See the article CONCORD.

MAJOR-DOMO, an appellation formerly given to the ſteward or maſter of the king's houſhold.

MAJORANA, MARJORAM, in botany, is comprehended by Linnæus among the origanums. See ORIGANUM.

Marjoram is attenuant and detergent, and recommended in nervous caſes, and diſeaſes of the lungs, as alſo in epileptic caſes.

MAJORCA, the capital of a ſpaniſh iſland of the ſame name: eaſt long. 2° 30′, north lat. 39° 30′.

This iſland is in the Mediterranean Sea, about ſixty miles long, and forty-five broad, ſituated about eighty miles ſouth of the coaſt of Catalonia, and an hundred miles eaſt of Valencia.

MAJORITY, the greater number of perſons. Several things are determined by a majority. Thus our laws are enacted by a majority of members of parliament, and the members themſelves are choſen by a majority of electors: alſo the act of the major part of every corporation, is accounted the act of the corporation; for where the majority is, there the law adjudges to be the whole.

MAIRE, or *ſtreights of le* MAIRE, is a paſſage to Cape Horn, ſituated between Terra del Fuego in ſouth America, and Statten iſland; which being diſcovered by Le Maire, obtained his name.

MAIZ, or INDIAN CORN, a plant called by Linnæus zea. See the article ZEA.

MAKE, in law, is to perform and execute. Thus to make his law, is to perform that law by which a man had formerly bound himſelf; and to make ſervices and cuſtoms, means no more than to perform them.

MAKING-UP, among diſtillers, the reducing ſpirits to a certain ſtandard of ſtrength, uſually called proof, by the admixture of water; which ſhould be either ſoft and clear river-water, or ſpring-water rendered ſoft by diſtillation. See the articles LOWERING and PROOF.

MALA, the cheek, in anatomy. See the article CHEEK.

The cheeks are compoſed of two bones of a hard ſubſtance, called by anatomiſts oſſa malarum, oſſa jugalia, or zygomatica. See FACE, MAXILLA, &c.

MALABAR, the ſouth-weſt coaſt of the peninſula of hither India, about 400 miles long, and 100 broad, bounded by Viſiapour, on the north; by the mountains of Baligate, on the eaſt; and by the Indian ocean on the weſt and ſouth.

MALACCA, the moſt ſoutherly part of the further peninſula of India, about 600 miles long, and generally about 200 miles broad; bounded by Siam, on the north; by the bay of Siam and the Indian ocean on the eaſt; and by the ſtreights of Malacca, on the ſouth-weſt. The capital of the country, which is alſo commonly called Malacca, is ſituated in 100° of eaſt long. and 2° 30′ north lat.

MALACHI, or *the prophecy of* MALACHI, a canonical book of the Old Teſtament, and the laſt of the twelve leſſer prophets. Malachi prophefied about three hundred years before Chriſt, reproving the Jews for their wickedneſs after their return from Babylon, charging them with rebellion, ſacrilege, adultery, prophaneneſs, and infidelity, and condemning the prieſts for being ſcandalouſly careleſs in their miniſtry: at the ſame time not forgetting to encourage the pious few, who in that corrupt age, maintained their integrity. This prophet diſtinctly poin-

at the Meſſiah, who was ſuddenly to come to his temple, and to be introduced by Elijah the prophet, that is, by John the baptiſt, who came in the ſpirit and power of Elias or Elijah.

MALACHITES, or MOLOCHITES, in natural hiſtory, &c. a ſpecies of jaſper, ſuppoſed to be poſſeſſed of amuletic virtues. See JASPER and AMULET.

MALACIA, μαλακια, in medicine, is a languiſhing diſorder incident to pregnant women, in which they long ſometimes for one kind of food, and ſometimes for another, and eat it with an extraordinary greedineſs. When women labouring under this diſorder begin to abſtain from the improper and abſurd things they were fond of, and with leſs reluctance uſe laudable and wholeſome aliments, it is an infallible ſign of a beginning cure and approaching health. Pregnant women are generally freed from the malacia, about the fourth month; but if it continues longer it is dangerous, becauſe the peccant humours are deeply rooted. For the cure of this diſorder, in pregnant women, but few medicines are recommended for fear of abortion: however gentle medicines may be uſed for evacuating and corroborating the ſtomach. In young women labouring under a chloroſis, this diſtemper is cured by the ſame medicines that are proper for removing the chloroſis. See the article CHLOROSIS.

MALACOPTERYGIOUS, among ichthyologiſts, an appellation given to one of the five orders of fiſhes, from their having the rays of their fins bony, but not pointed or ſharp at the extremities, like thoſe of acanthopterygious fiſhes. See the articles FISH and ICHTHYOLOGY.

MALACOSTOMOUS FISHES, thoſe deſtitute of teeth in the jaws, called in engliſh leather-mouthed: as the tench, carp, bream, &c. See TENCH, &c.

MALACOSTRACA, in zoology, the ſame with cruſtaceous animals.

MALAGA, a city and port of Spain, in the province of Granada, ſituated in the Mediterranean, ſixty-ſix miles north-eaſt of Gibraltar: weſt long. 4° 45′, north lat. 36° 40′.

MALAGMA, a cataplaſm. See the article CATAPLASM.

MALAMOCCA, a ſmall iſland and port-town in the lagunes of Venice, ſituated five miles ſouth of that city.

MALANDERS, a diſeaſe incident to horſes, proceeding from corrupt blood, hard labour, or being over-ridden, and ſometimes for want of clean keeping and rubbing. It conſiſts of certain chops or chinks which appear on the inſide of the fore legs, juſt againſt the bending of the knee, which diſcharge a red, ſharp, pungent water. The ſureſt method of cure is to waſh the part very clean with urine, or oil of nuts ſhaken with water, and then to mingle equal quantities of linſeed-oil and aqua-vitæ, ſtirring and ſhaking them till the mixture grows white, with which anoint the part once a day.

MALDIVA ISLANDS, are about a thouſand ſmall iſlands, in the Indian ocean, 500 miles ſouth-weſt of the continent of the hither India, extending from the ſecond degree of ſouth latitude, to the ſeventh degree of north latitude.

MALDON, a port-town of Eſſex, ten miles eaſt of Chelmsford. It ſends two members to parliament.

MALE, *mas*, among zoologiſts, that ſex of animals which has the parts of generation without the body. See the articles ANIMAL and GENERATION.

The term male has alſo, from ſome ſimilitude to that ſex in animals, been applied to ſeveral inanimate things: thus we ſay, a male-flower, a male-ſcrew, &c. See the articles FLOWER and SCREW.

MALE BALSAM, *momordica*, in botany. See the article MOMORDICA.

MALICE, in law, is a premeditated deſign to do miſchief to another.

Malice is neceſſary to conſtitute the crime of murder. So where a perſon has a malicious intent to kill, and in the execution of this malicious deſign kills a third perſon by accident, he is, on account of his malice, deemed guilty of murder. See the article MURDER.

MALIGNANT, among phyſicians, a term applied to diſeaſes of a very dangerous nature, and generally infectious: ſuch are the dyſentery, hoſpital-fever, &c. in their worſt ſtages. See DYSENTERY, HOSPITAL FEVER, PETECHIÆ, &c.

MALINES, or MECHLIN. See the article MECHLIN.

MALL, or SEA-MALL, in ornithology, the engliſh name of the leſſer gull, with a grey back and ſpotted neck, and about the ſize of the common tame pigeon. See the article LARUS.

There is alſo another ſpecies called by the name of mall, as large as a pullet.

MALLEABLE, a property of metals, whereby they are capable of being extended under the hammer. See the articles DUCTILITY and METAL.

MALLE-

MALLEOLUS, in anatomy, a name given by anatomiſts to the inferior extremities of the tibia and fibula.

MALLET, a kind of large wooden hammer uſed by artificers who work with a chiſſel, as ſculptors, maſons, and ſtone-cutters, whoſe mallets are commonly round, and by joiners, carpenters, &c. who work with ſquare-headed mallets.

MALLEUS, in anatomy, a bone of the ear, ſo called from its reſemblance to a mallet, and in which is obſerved the head, the neck and handle, which is joined to the membrane of the tympanum. See EAR.

MALLING, a market-town of Kent, five miles weſt of Maidſtone.

MALLO, a town of Ireland, in the county of Cork, ſeventeen miles north of Cork city.

MALLOW, MALVA, in botany. See the article MALVA.

Vervain MALLOW. See ALCEA.

MALMEDY, a town of Germany, in the circle of Weſtphalia, and biſhopric of Liege; nine miles ſouth of Limburgh.

MALMOE, a port-town of Sweden, in the province of Gothland, twenty miles ſouth-eaſt of Copenhagen.

MALMSBURY, a borough-town of Wiltſhire, thirty miles ſouth-weſt of Saliſbury: it ſends two members to parliament.

MALMSEY, a rich kind of wine, ſo called, as being brought from Malvaſia, in the Morea; for the duty on which ſee the article WINE.

MALO, or *St.* MALO, a city and port-town of France, in the province of Britany, ſituated on a rock, in the engliſh channel, but joined to the continent by a cauſeway: weſt long. 2°, north lat. 48° 40′.

MALOPE, *betony-leaved* MALLOW, in botany, a genus of the monadelphia-polyandria claſs of plants, the flower of which is like that of the common malva: the fruit is compoſed of a number of conglomerated capſules, each containing a ſingle kidney ſhaped ſeed.

MALPAS, a market-town of Cheſhire, ten miles ſouth-eaſt of Cheſter.

MALPIGHIA, in botany, a genus of the decandria-trigynia claſs of plants; the flower of which is compoſed of five large, hollow, kidney-ſhaped petals, with long and linear ungues: the fruit is a large globoſe berry, with one cell, containing three oſſeous, oblong, obtuſe, and angulated ſeeds; each having an oblong, and obtuſe kernel.

MALPLAQUET, a village in the auſtrian Netherlands, in the province of Hainault, about ſeven miles from Mons.

MALT, is barley prepared, to fit it for making a potable liquor called beer, or ale, by ſtopping it ſhort at the beginning of vegetation.

In making malt from barley, the uſual method is to ſteep the grain in a ſufficient quantity of water, for two or three days, till it ſwells, becomes plump, ſomewhat tender, and tinges the water of a bright brown, or reddiſh colour. Then the water being drained away, the barley is removed from the ſteeping ciſtern to the floor, where it is thrown into what is called the wet couch; that is, an even heap, riſing to the height of about two feet. In this wet couch, the capital part of the operation is performed; for here the barley ſpontaneouſly heats, and begins to grow, ſhooting out firſt the radicle, and if ſuffered to continue, then the plume, ſpire or blade. But the proceſs is to be ſtopped ſhort at the eruption of the radicle, otherwiſe the malt would be ſpoiled. In order to ſtop it, they ſpread the wet couch thin over a large floor, and keep turning it once in four or five hours, for the ſpace of two days, laying it ſomewhat thicker each time. After this, it is again thrown into a large heap, and there ſuffered to grow ſenſibly hot to the hand, as it uſually will in twenty or thirty hours time; then being ſpread again, and cooled, it is thrown upon the kiln, to be dried criſp without ſcorching.

This is the general proceſs of malting, in which almoſt every maltſter has his ſecret, or particular way of working. But to render the operation perfect, the following cautions muſt be obſerved. 1. That the barley be newly thraſhed, or at leaſt newly winnowed. 2. That it be not mixed, or made up of different ſorts. 3. That it be not over ſteeped in the ciſtern, or ſo long as to make it ſoft. 4. That it be well drained. 5. That it be carefully looked after in the wet couch, ſo as to ſtop the firſt tendency of the blade to ſhooting. 6. Another caution is, to turn the wet couch inſide outermoſt, if the barley comes, and ſhoot more in the middle of the heap than at the ſides. 7. To keep it duly turning after it is out of the wet couch. 8. To give it the proper heating in the heap. 9. To dry and criſp it thoroughly upon the kiln, but without a fierce fire, ſo as to be ſeveral days in drying a kiln

of pale malt. And if theſe directions be carefully obſerved, the malt will always be good.

The method of malting indian corn or Virginia-wheat, is much leſs laborious. For, if this corn be buried two or three inches deep in the earth, and covered with the looſe mould, dug up to make room for it, in ten or twelve days time the corn will ſprout, and appear like a green field; at which time being taken up, and waſhed or fanned from its dirt, it is immediately committed to the kiln, and by this means it becomes good malt. It is obſervable of this corn, that both its root and blade muſt ſhoot to a conſiderable length, before it will make malt; and, perhaps, this is the caſe in all large bodied grain.

The importation of malt from beyond the ſeas is prohibited: and on its being exported, it is not only freed from paying the exciſe of 6d. a buſhel, but a bounty is allowed by act of parliament, for which ſee the article CORN.

Malt-liquors have different names, and different virtues, from the different methods of preparing the malt, whence they are diſtinguiſhed into pale and brown; and from the various methods taken in brewing the liquors, whence they are divided into ale and beer, ſtrong and ſmall, new and old. See BREWING

The colour of the liquor, and many of its effects, depend on the manner of drying the malt it is brewed with; that which has the paleſt tinge, is made with malt but ſlenderly dried; whereas that which is high coloured, is made with malt that is high dried, or roaſted, as it were, in compariſon of the other; and amber-ale is made of a mixture of both.

Another difference in the preparations of malt-liquors conſiſts in the larger quantity of hops in beer, and the ſmaller in ale; for hops add ſomething of an alkaline nature to the liquor, and not only render it more eaſy of digeſtion, and ſecretion in the body, but while it is in the liquor, prevent its running into ſuch cohefions, as would make it ropy, vapid and ſour: for this reaſon Dr. Quincy is of opinion, that for one conſtitution injured by beer, there are numbers ſpoiled by ale, which is apt to ſtuff the veſſels with ſlime and viſcidity, to make the body unwieldy and corpulent, and to pave the way for cachexies, the jaundice, aſthmas, and the dropſy. The different degrees of ſtrength in malt-liquors, alſo make them produce different effects. The ſtronger they are, the more viſcid parts they carry into the blood: they are therefore in general the more wholeſome for being ſmall; that is, of ſuch a ſtrength as to carry ſome degree of warmth into the ſtomach, but not ſo as to prevent their being proper diluters of our neceſſary food. Indeed people of robuſt conſtitutions, who labour very hard, may diſpenſe with reaſonable quantities of the ſtrongeſt; eſpecially as their food is frequently poor and ſlender enough, the deficiencies of which this ſupplies; and their continual exerciſe and ſtrength of body, digeſts and breaks the viſcidities of the drink into convenient nouriſhment: though in perſons of another habit, and way of living, they would only produce obſtructions and ill humours. As to the age of theſe liquors, it has ſomewhat the ſame effect as hops, for thoſe that are longeſt kept, are certainly leaſt viſcid: for age, by degrees, breaks their viſcid parts, and by rendering them ſmaller, makes them fitter for ſecretion.

MALT-SPIRITS. See the articles DISTILLERY and SPIRIT.

MALTA, the capital of a ſmall iſland of the ſame name in the Mediterranean, is ſituated in eaſt long. 15°, north lat. 35° 15′; conſiſting of three towns, ſeparated by channels, which form ſo many peninſulas of ſolid rock, riſing a great height above the ſea: the ſituation is ſtrong, and no art is wanting in the fortifications to render it impregnable.

Knights of MALTA, otherwiſe called, *hoſpitalers of St. John of Jeruſalem*, a religious military order, whoſe reſidence is in the iſland of Malta. The order conſiſts of three eſtates, the knights, chaplains, and ſervants at arms: there are alſo prieſts who officiate in the churches, friar-ſervants, who aſſiſt at the offices, and donnes or demicroſſes; but theſe are not reckoned conſtituent parts of the body: the government of the order is mixt, being partly monarchical, and partly ariſtocratical: the grand maſter is ſovereign. The knights formerly conſiſted of eight different languages, but now only ſeven, the engliſh having withdrawn themſelves. None are admitted into this order but ſuch as are of noble birth: the knights are of two ſorts, thoſe who have a right to be candidates for the dignity of grand maſter, called grand croſſes, and thoſe who are only knights aſſiſt-

assistants: they never marry, yet have continued from 1090 to the present time. The knights are received into this order either by undergoing the trials prescribed by statutes, or by dispensation.

Earth of MALTA. See the article BOLE.

MALTHA, in antiquity, a kind of cement, of which there were two sorts, native and factitious; one of the latter sort, much in use, consisted of pitch, wax, plaster, and grease. Another kind used by the Romans in their aqueducts, was made of lime slacked in wine, incorporated with melted pitch, and fresh figs. Natural maltha is a kind of bitumen, wherewith the Asiatics plaster their walls; and which being once set on fire, water makes it burn more fiercely.

MALTON, a borough of Yorkshire, situated on the river Derwent, twenty miles north-east of York. It sends two members to parliament.

MALVA, MALLOW, in botany, a genus of the monadelphia-polyandria class of plants, the corolla whereof consists of five petals, vertically cordated, plane, and growing together at the base; the fruit consists of a great number of capsules, joined together by an articulation, and of an orbicular depressed figure, separating from one another, and opening inwardly: the receptacle affixed to the capsules is columnar: the seed is solitary and kidney-shaped.

Mallow is one of the five emollient herbs, being loosening, cooling, and mollifying; a cataplasm of the leaves of this plant eases the sting of bees and wasps.

MALVASIA, or NAPOLI DE MALVASIA, a city and port-town of European Turky, in the province of Morea, situated in the Archipelago, thirty miles east of Misitra.

MALUS, the APPLE-TREE, in botany, is, according to Linnæus, a species of the pyrus. See APPLE and PYRUS.

MAMALUKES, the name of a dynastie that reigned in Egypt.

The mamalukes were originally turkish and circassia-slaves, bought of the Tartars by Melicsaleh, to the number of a thousand, whom he bred up to arms, and raised some to the principal offices of the empire. They killed sultan Moadam, to whom they succeeded.

Others say, that the mamalukes were ordinarily chosen from among the christian slaves, and that they were the same thing in a great measure with the janissaries among the Turks. They never married; they first are said to have been brought from Circassia, and some have supposed that they began to reign about the year 869.

MAMMÆ, the BREASTS, in anatomy. See the article BREAST.

MAMMEA, in botany, a genus of the polyandria-monogynia class of plants, the corolla whereof consists of four roundish concave patent petals, greater than the cup: the fruit is a carnose berry, very large, pointed, with the style of a spherical figure, and containing only one cell: the seed, being either four or one in number, is callous, and of an oval figure.

MAMMIFORM, in anatomy, a name given to apophyses of the bone in the back part of the scull, so called from their resembling a breast.

MAMMILLARY, MAMMILLARIS, in anatomy, an epithet given to two little protuberances, somewhat resembling the nipples of the breast, found under the four ventricles of the brain, and supposed to be the organs of smelling. These are called apophyses mammillares. There is also a muscle called mamillaris, or mastoides, serving to stoop the head.

MAMMOTH's TEETH, in natural history, certain large fossile teeth, found in great plenty in Russia, and supposed to have belonged to elephants.

MAN, *homo*, in zoology, is justly ranked at the head of the animal part of the creation; making a distinct genus of that order of quadrupeds, which Linnæus calls anthropomorpha, from their resemblance to the human form. See the article ANTHROPOMORPHA.

The same author distinguishes the race of mankind, according to their different colours, into the Europeans, or white men; the Americans, or ruddy-coloured men: the Asiatics, or tawney-coloured men; and those of Africa, or blacks.

Nosce te ipsum, know thyself, is a precept worthy of the law-giver of Athens, the antient seat of polite literature; an important branch of knowledge, which may be reduced to the following heads. 1. In a religious view, *theologicè*, that you was created with an immortal soul, after the image of God. 2. In a moral sense, *moraliter*, that you alone was blessed with a rational soul, to be employed to the praise of the creator. 3. With respect to the other works of the creation, *naturaliter*, that you are constituted their lord, for whose use they were made.

In a phyſiological ſenſe, *phyſiologicè*; the moſt perfect and amazing fabric of your body. 5. With regard to diet, *diætetice*, what things are uſeful, and what hurtful, in this reſpect. 6. In a pathological ſenſe, *pathologicè*, how frail you are, and how ſubject to a thouſand calamities.

Theſe are the heads, which, according to Linnæus, comprehend the knowledge of man, conſidered as an individual; a branch of knowledge ſo eſſential to the human race, that, without it, he ſeems to doubt whether any other characters be ſufficient to entitle one to be ranked among mankind: for he adds, *Hæc ſi noveris*, HOMO *es, et a reliquis animalibus diſtinctiſſimum genus.*

The whole of this work may, in ſome reſpect, be accounted an analyſis of MAN; as comprehending his knowledge of God, of himſelf, and of natural and artificial objects. See the INTRODUCTION.

We have traced him from his conception to his birth, infancy, puberty, married ſtate, old age, and death. We have conſidered him as a parent, a child, and a member of ſociety, in all the various ſituations and connections of human life. We have anatomized, ſo to ſpeak, his mental faculties no leſs than the members of his body. In ſhort, to give a juſt notion of mankind, and of their perſonal and ſocial capacities, of their manners, cuſtoms, opinions, advantages and diſadvantages, has been our ſtudy through the whole of this work; which, being reduced to the form of a dictionary, may, with the greateſt eaſe, be conſulted at pleaſure, on whatever ſubject the reader deſires to be informed.

As to the articles which more immediately concern mankind, the reader may turn to GENERATION, FOETUS, INFANT, PUBERTY, MARRIAGE, DIET, DISEASE, MORTALITY, KNOWLEDGE, REASON, *&c.*

MANAGE, or MANEGE. See MANEGE.

MANAR, an eaſt indian iſland, ſituated between Ceylon and the continent.

MANCHA, a territory of Spain, in the province of New Caſtile.

MANCHE, the french name for the engliſh Channel.

MANCHESTER, a large town of Lancaſhire, forty miles ſouth-eaſt of Lancaſter.

MANDAMUS, in law, a writ that iſſues out of the court of king's bench, ſent to a corporation, commanding them to admit or reſtore a perſon to his office. This writ alſo lies where juſtices of the peace refuſe to admit a perſon to take the oaths, in order to qualify himſelf for enjoying any poſt or office; or where a biſhop or archdeacon refuſes to grant a probate of a will, to admit an executor to prove it, or to ſwear a church-warden, *&c.*

MANDARINS, a name given to the magiſtrates and governors of provinces in China, who are choſen out of the moſt learned men, and whoſe government is always at a great diſtance from the place of their birth. Mandarin is alſo a name given by the Chineſe to the learned language of the country; for beſides the language peculiar to every province, there is one common to all the learned in the empire, which is in China what latin is in Europe; this is called the mandarin tongue, or the language of the court.

MANDATE, in law, a judicial commandment to do ſomething. See the article MANDAMUS.

MANDATE, in the canon-law, a reſcript of the pope, commanding an ordinary collator to put the perſon therein named in poſſeſſion of the firſt vacant benefice in his collation.

MANDERSCHEIT, a city of Germany, in the electorate of Triers, and the capital of the county of Manderſcheit: eaſt long. 6° 32′, north lat. 50° 20′.

MANDRAGORA, MANDRAKE, in botany, a genus of the pentandria-monogynia claſs of plants, the corolla whereof conſiſts of a ſingle erect hollow petal, growing gradually wider from the baſe; being a little larger than the cup, and divided beyond the middle into five lanceolated ſegments: the fruit is a great globoſe berry, containing two cells: the receptacle is fleſhy and convex on both ſides: the ſeeds are numerous and kidney ſhaped. The mandragora has been eſteemed a poiſon, by many; and by others, it is declared innocent: the bark of the root was once uſed as a narcotic; but at preſent the leaves are only uſed in medicine.

MANFREDONIA, a city and port of the kingdom of Naples, ſituated in the bay of Manfredonia, in the gulph of Venice: eaſt long. 16° 40′, north lat. 41° 20′.

MANDREL, a kind of wooden pulley, making a member of the turner's lathe, of which there are ſeveral kinds, as the flat mandrels, which have three or more little pegs or points near the verge, and are uſed for turning flat boards on; the pin mandrel are thoſe which have a long wooden ſhank to fit into a large hole

made in the work to be turned; hollow mandrels are those hollow of themselves, and used for turning hollow work; screw mandrels for turning screws, &c.

MANE, the hair hanging down from a horse's neck, which should be long, thin, and fine; and if frizzled, so much the better.

MANEGE, or MANAGE, the exercise of riding the great horse, or the ground set apart for that purpose; which is sometimes covered, for continuing the exercise in bad weather; and sometimes open, in order to give more liberty and freedom both to the horseman and horse.

One way or other, we always suppose a center in the middle of the manege-ground, for regulating the rounds and volts. Sometimes this center is distinguished by a pillar fixed in it, to which they tie the horse when he begins to learn: upon the side of the manege other pillars are placed, two by two, in order to teach horses to raise the fore-quarters, by tying them with ropes. See PILLAR.

The manege or exercise of a horse, is a particular way of working or riding him. Make your horses work upon the air and the manege that you used to put them most to. A horse is said to manege, when he works upon volts and airs, which supposes him broke and bred.

A horse is said to be thoroughly maneged, or a finished horse, that is well broke and bred, and confirmed in a particular air or manege. High manege, is the high or raised airs which are proper for leaping-horses.

In choosing a horse for the manege, make choice of a horse of a middle size, that is lively, full of spirit and action, short trussed, well coupled, having good feet and legs, and shoulders very easy and supple. It ought also to be observed, that horses that have thick, stiff, and short joints, that is no ways flexible or pliant, are unfit for the manege; for glib and bending joints, if they be not too long, are one of the chief qualities requisite in a fine and delicate horse of manege.

As for the age most proper to begin to work a horse designed for the manege, he should not be too young, not only because his apprehension is not yet come to him, but also because a horse of three years old being but a gristle, stopping and going back will spoil him, by straining his back and stretching his hams.

MANES, in the pagan system of theology, a general name for the infernal deities, or gods of hell.

The antients comprehended under manes not only Pluto, Proserpine, and Minos, but the souls likewise of the deceased were taken into the number, and esteemed gods of hell. It was usual to erect altars and offer libations to the manes of deceased friends and relations. One branch of the magic art among the pagans consisted in consulting the manes of the dead in matters of importance: this was called Necromancy. See NECROMANCY.

MANGALOR, or MANGUELOR, a port-town of the Hither India, situated on the Malabar-coast, in east long. 74°, north lat. 13°.

MANGANESE, MAGNESIA, in natural history, a poor kind of iron-ore. See the article IRON.

It is a dense, heavy substance in its finest pieces; being composed of a number of broad and thick striæ irregularly laid together, and much resembling those of native antimony; in these masses it is sometimes reddish, sometimes of a dark grey, and sometimes of a fine pale light grey, approaching to the colour of the finest polished iron: but there is a less perfect kind in which the whole mass seems only to consist of a number of irregularly figured pieces, of a brittle and somewhat glossy ore, blended very loosely together.

Manganese is found in great abundance in the german and swedish mines, as also in France, Italy, and England; but ours is not equal in beauty or goodness to the german. It is recommended by authors as an astringent, and ordered to be given after calcination in hæmorrhages; but it is very improper for internal use. It is of great service, however, to the glassmen, in clearing away the greenish colour from their white glass while in fusion. See GLASS.

MANGIFERA, in botany, a genus of the pentandria-monogynia class of plants; the calyx of which is a five-leaved perianthium; the corolla consists of five spear-shaped petals, longer than the cup; the fruit is a kidney-shaped oblong globous, compressed, drupe: the seed is an oblong compressed woolly nut.

MANGOSTANS, or MAGOUSTANS, the fruit of the garcinia. See GARCINIA.

MANHEIM, a city of Germany, in the palatinate of the Rhine, situated at the co

confluence of the Rhine and Neckar: east long. 7° 20′, north lat. 49° 30′.

MANIA, MADNESS, in medicine. See the article MADNESS.

MANICHEES, in church-history, a sect of christian heretics in the third century, the followers of Manes, who made his appearance in the reign of the emperor Probus; pretending to be the comforter, whom our Saviour promised to send into the world. He taught that there are two principles, or gods, coeternal and independant on each other, the one the author of all evil, and the other, of all good; a doctrine which he borrowed from the persian magi. He held that our souls were made by the good principle, and our bodies by the evil one, and that the souls of his followers passed through the elements to the moon, and from thence to the sun, where being purified, they then went to God, and became united with his essence; but as for the souls of other men, they either went to hell, or were united to other bodies. He alledged, that Christ had his residence in the sun, the Holy Ghost in the air, wisdom in the moon, and the father in the abyss of light. He is also charged with denying the resurrection and condemning marriage; with teaching that Christ was the serpent that tempted Eve; with forbidding the use of eggs, cheese, milk and wine, as proceeding from the bad principle; with using a different kind of baptism from that of the church; with teaching that magistrates were not to be obeyed, and with condemning the most lawful wars.

MANICORDON, or MANICHORD, a musical instrument in the form of a spinet; the strings of which, like those of the clarichord, are covered with little pieces of cloth, to deaden, as well as to soften, their sound; whence it is also called the dumb spinet. It is much used in nunneries, because the nuns may play upon it without disturbing that silence which they are obliged to observe in their cells.

MANIFESTO, a public declaration made by a prince in writing, shewing his intentions to begin a war, or other enterprize, with the motives that induce him to it, and the reasons on which he founds his rights and pretensions.

MANIHOT, or MANIOC, in botany, a plant otherwise called jatropha. See the article JATROPHA.

MANILLE, in commerce, a large brass-ring in the form of a bracelet, either plain or engraven, flat or round.

Manilles are the principal commodities which the europeans carry to the coast of Africa, and exchange with the natives for slaves. These people wear them as ornaments on the small of the leg, and on the thick part of the arm above the elbow. The great men wear manilles of gold and silver, but these are made in the country by the natives themselves.

MANINGTREE, a market-town of Essex, twenty-five miles north-east of Chelmsford.

MANIPULUS, in roman antiquity, a body of infantry, consisting of two hundred men, and constituting the third part of a cohort. See the article COHORT.

Among physicians, the term manipulus signifies a handful of herbs or leaves, or so much as a man can grasp in his hand at once; which quantity is frequently denoted by the abbreviature, M, or m.

MANIS, the SCALY LIZARD, in zoology, a genus of quadrupeds, of the order of the agriæ; the body of which is covered with a kind of scales, and it has no ears: there is but one known species of this genus, which has been confounded with the lizards: this is an animal of great beauty, and perhaps one of the most singular in the world; its aspect has a great shew of terror, but it is the most inoffensive creature imaginable: its form is somewhat like the lizard: it is about four feet in length, and its body, in the broadest part, which is towards the hinder legs, is about ten inches in breadth; it is of a rounded figure on the back; the legs are short, and stand about a foot distance; the rest of the creature, from the hinder part to the extremity, is a tail, broad, thin, and between two and three feet in length; it is not connected to the hinder-part of the body, but is continuous with it: the whole upper surface of this creature, the back, and the outsides of the legs are covered with an armature of scales; the belly and insides of the legs are naked; the scales are of a firm substance, and have very much the appearance of tortoise-shell; they are on the body two inches in length, and more than an inch in breadth, of an oval figure, and each terminating in a kind of spine; the head is small, of a conic figure, about three inches in diameter at the base, and thence gradually growing smaller to the snout, which is sharp and naked;

naked; the head is covered with the ſame ſort of ſcales with that of the body, only they are ſmaller; there are no teeth in the mouth, but the tongue is ten inches or more in length; the whole creature is of a brown colour; the ſtriated parts of the ſcales is of a red, duſky brown; the ſmooth, poliſhed part has an admixture of yellow; the ſides of the body, and thoſe of the tail, are of a ſerrated form, the ſcales terminating one over another at ſome diſtance; the legs are robuſt, and the claws very ſtrong and thick; it is a native of the eaſt Indies and South America, lives in the woods, and feeds on inſects, as the ant-bear does, thruſting out its tongue till covered with them, and then drawing it in loaded with the food.

MANNA, in the materia medica, the concreted juice of ſome vegetable, naturally exſudating from it, ſoluble in water, and not inflammable.

It is a honey-like juice, brought to us from Calabria and Sicily, ſometimes in ſmall granules, or drops of an irregular figure, roundiſh, oblong, crooked, and ſometimes contorted. It ſhould be choſen whitiſh, or at the utmoſt, with only a faint caſt of yellow, not too heavy, in regular dry granules, or in moderately long ſtriæ or flakes, of a pleaſant taſte, and diſſolving wholly in the mouth, not leaving a farinacious ſubſtance behind it, as much of the common manna does, that has been adulterated with honey and flour.

Manna is the mildeſt and ſafeſt of all purges, and may be given to children, to women with child, and to people of the moſt tender conſtitutions, with perfect ſafety; and it never fails gently to move the bowels, and to carry off the thick viſcid foulneſſes from them. Its doſe is from two drams to an ounce or more, and is moſt conveniently given in ſolution. When required to work more violently than it naturally would, it may be quickened with an addition of Glauber's ſalt.

Manna is obtained from ſeveral ſorts of trees, eſpecially aſh; and the fineſt kind is that which oozes naturally out of the leaves. Beſides which there is another coarſer kind obtained by wounding the bark of the trunk and branches of theſe trees.

In the french ſhops there is alſo met with a manna, produced from the larch-tree; and our black-thorn, or ſloe-tree, ſometimes yields a true manna from the juice of the leaves. The manna perſicum, or perſian manna, is obtained from a ſhrub called alhagi. See the article ALHAGI. As to the manna mentioned in ſcripture, it could not be true manna, becauſe it melted with the heat of the ſun; which true manna does not, but rather hardens by it.

The antient Greeks likewiſe called the ſmall fragments of frankincenſe, by the name manna.

MANNER, in painting, a habitude that a man acquires in the three principal parts of painting, the management of colours, lights and ſhadows, which is either good or bad, according as the painter has practiſed more or leſs after the truth, with judgment and ſtudy. But the beſt painter is he, who has no manner at all. The good or bad choice he makes is called goûte.

MANNERS, in poetry, the inclinations, genius and humour, which the poet gives to his perſons, and whereby he diſtinguiſhes his characters. See the article CHARACTER.

MANNING, in the navy, denotes the providing a ſhip or fleet with a ſufficient number of men for an expedition.

In manning the navy, it is uſual to promiſe by proclamation, a bounty to all ſeamen, and able-bodied landmen, who come into the ſervice by a certain time, which is frequently two months pay, and ſeldom more. This does indeed prevail on many, yet great numbers conceal themſelves until the fleet is at ſea, and others lurk about even till the time limited for ſuch bounty is near expired, which does not a little prevent fleets often times from being in a readineſs for an early expedition.

And as ſeamen are thus encouraged to enter themſelves voluntarily, ſo there is another method uſed to compel them to it, and that is, preſſing them by warrant from the lord high admiral to the captains, and by them aſſigned to their lieutenants; and to render this the more effectual, veſſels are purpoſely hired into the ſervice to proceed from place to place with thoſe officers, and their preſs gangs, not only to receive volunteers, but to impreſs what men they can light on. Notwithſtanding this, their ſucceſs is very uncertain, and always expenſive; therefore, it is much to be wiſhed, in a matter of ſo great a conſequence to the nation, that more ſpeedy and effectual

methods could be taken for manning the fleet.

MANOMETER, or MANOSCOPE, an inſtrument to ſhew or meaſure the alterations in the rarity or denſity of the air. The manometer differs from the barometer in this, that the latter only ſerves to meaſure the weight of the atmoſphere, or of the column of air over it; but the former the denſity of the air in which it is found, which denſity depends not only on the weight of the atmoſphere, but alſo on the action of heat and cold, &c. Authors, however, generally confound the two together, and Mr. Boyle himſelf gives us a very good manometer of his contrivance, under the title of a ſtatical barometer. See BAROMETER.

MANOR, an antient royalty or lordſhip, formerly called a barony, conſiſting of demeſnes, ſervices, and a court-baron; and comprehending in it meſſuages, lands, meadow, paſture, wood, rents, an advowſon, &c. It may contain one or more villages, or hamlets, or only a great part of a village, &c.

A manor is a noble kind of fee, granted in part to tenants for certain ſervices to be performed, and partly reſerved to the uſe of the lord's family, with juriſdiction over the tenants, for their farms or eſtates.

There are capital manors or honours, that have other manors under them: and alſo cuſtomary manors granted by copy of court-roll, the lords of which have power to hold courts, and grant copies, &c.

MANS, the capital of the territory of Maine, in the province of Orleanois, in France: eaſt long. 5′, north lat. 48° 6′.

MANSE, in law, is a farm-houſe, with land belonging to it.

MANSFIELD, a city of Germany, the capital of a county of the ſame name, in the circle of Upper Saxony: eaſt long. 11° 45′, north lat. 51° 36′.

MANSFIELD is alſo a market-town of Nottinghamſhire, twelve miles north of Nottingham.

MANSION, in law, is the chief dwelling houſe of a lord within his fee, or the capital meſſuage, or manor-houſe.

Manſion alſo, in a more general ſenſe, ſignifies any dwelling-houſe, and even a chamber in one of the inns of court comes under the denomination of a manſion; but this is not the caſe, with reſpect to any other chamber in which a perſon lodges.

MANSLAUGHTER, generally termed homicide, is killing a perſon without premeditated malice.

Manſlaughter differs from murder, in its not being committed from the dictates of a former malicious intention; and from chance-medley, in its being done with a preſent intention to kill. Thus, where two perſons, who before meant no harm to each other, meet and quarrel, and in the heat of paſſion one kills the other; in this caſe he is guilty of manſlaughter. If two perſons fall out and fight, and the one breaks the other's ſword, on which a ſtander by lends him another, with which the adverſary is killed, it is manſlaughter both in the ſlayer and ſtander-by. And where a man is taken in adultery with another perſon's wife, and the huſband immediately draws and kills him, it is only manſlaughter, the huſband having had a juſt provocation for ſo doing; but where any other perſon ſtabs another, who has not a weapon drawn, or ſtruck firſt, ſo that the perſon ſtabbed dies within ſix months, notwithſtanding there was not malice aforethought, it is felony without benefit of clergy. In other caſes, though manſlaughter is acoounted felony, yet for the firſt offence the offender is allowed the benefit of clergy.

MANTELETS, in the art of war, a kind of moveable parapets, made of planks about three inches thick, nailed one over another, to the height of almoſt ſix feet, generally caſed with tin, and ſet upon little wheels, ſo that in a ſiege, they may be driven before the pioneers, and ſerve as blinds to ſhelter them from the enemy's ſmall ſhot. See plate CLXX. fig. 3.

There are other ſorts of mantelets covered on the top, whereof the miners make uſe to approach the walls of a town or caſtle.

MANTIS, the PRAYING LOCUST, in zoology, a ſpecies of gryllus, ſo called from the poſture wherein it uſually holds its anterior pair of legs.

MANTLE, or MANTLE-TREE, in architecture, the lower part of the chimney, or that piece of timber which is laid acroſs the jaumbs and ſuſtains the compartment of the chimney-piece. See the article CHIMNEY.

MANTLE, or MANTLING, in heraldry, that appearance of folding of cloth, flouriſhing or drapery, that is in any atchievement drawn about the coat of arms.

arms. It is ſuppoſed originally to be the repreſentation of a mantle, or military habit, worn by the antient cavaliers over their armour to preſerve it from ruſt; or, as others hold, a ſhort covering only worn over the helmet, which in after-times was lengthened, and made to hang from the helmet below the whole ſhield, as in plate CLXV. fig. 3.

The mantle is always ſaid in blazon, to be doubled, that is, lined throughout with one of the furs, as ermin, pean, viary, &c. See the article COAT.

MANTUA, the capital of a dutchy of the ſame name, in Italy, is ſituated in the middle of a lake, formed by the river Mincio, but has a communication with the continent by three cauſeways: eaſt long. 11° 15′, north lat. 45° 20′.

MANUCAPTIO, in law, a writ which lies for a man who being taken on ſuſpicion of felony, and offering ſufficient bail for his appearance, is refuſed to be admitted thereto by the ſheriff, or other perſon having power to let to mainprize.

MANUCODIATA, in ornithology, the bird of Paradiſe. See PARADISE.

MANUMISSION, in roman antiquity, the act of ſetting a ſlave at liberty, which was uſually performed before the prætor, who laid his wand, called vindicta, on the ſlave's head, and declared him free.

MANUFACTURER, one who works up a natural product into an artificial commodity.

Perſons employed in making up the woollen, linen, fuſtian, cotton, or iron manufactures, and all journeymen dyers, hot-preſſers, ſhoe-makers, glovers, thoſe employed in making of hats, or in any manufactures of ſilk, mohair, fur, hemp, flax, leather, or of any mixed materials, who ſhall leſſen the value, embezzle or purloin any materials with which they are intruſted, on being convicted by the oath of one witneſs, or confeſſion before a juſtice of peace, are to forfeit double the value of the damages ſuſtained, with coſts: and in caſe immediate payment be neglected, the juſtice is to commit the offender to the houſe of correction to be whipped, and to ſuffer hard labour for a term not exceeding fourteen days. and on further conviction for embezzling any of the materials, whether they be, or be not made up, the perſons are to forfeit four times their value, with coſts. And if payment with coſts be neglected, they are to be committed to the houſe of correction, to hard labour, for a time not exceeding three months, nor leſs than one, and to be whipped in the market-town, at the market-place, or croſs, once or oftener. And if any perſon buy, or take by way of gift, pawn, or ſale, any materials, knowing the ſame to be embezzled, he is to ſuffer the ſame forfeiture, as the perſon purloining them; all which forfeitures, are by 13 Geo. II. to be applied, one half to the party injured, and the other to the poor of the pariſh. But any one aggrieved, may appeal to the general or quarter-ſeſſions. If any perſon intruſted with materials to manufacture, ſhall not uſe them, and ſhall delay, for twenty days after ſuch materials ſhall be manufactured, to return (if required by the owner) ſo much as ſhall not be uſed, ſuch neglect will be deemed an embezzling. And if any perſon who ſhall work up any of the manufactures for one maſter, ſhall neglect to finiſh them by procuring himſelf to be retained by another, before the work ſhall be completed, he ſhall be ſent to hard labour, not exceeding one month.

MANURE, any thing uſed for fattening and improving land.

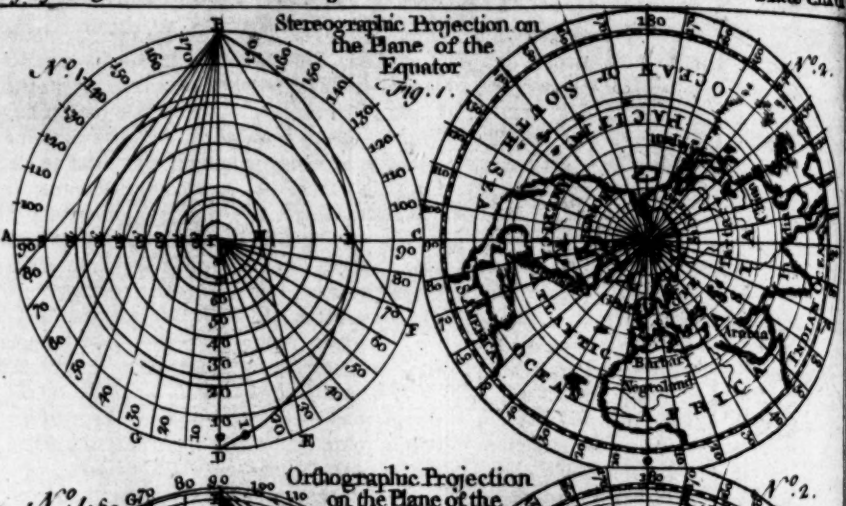
There are various kinds of manure uſed in different parts of England, for enriching the ſeveral ſoils, ſome of which have been already mentioned under the articles dung, chalk, lime, &c. which ſee: but there are others that might be uſed on many lands with equal ſucceſs.

All ſorts of marl and clay, ſpread over gravelly and ſandy land, are of vaſt advantage to it, by making it more ſolid and tenacious, as all kinds of ſand are to thoſe ſoils that conſiſt of a ſtiff loam or clay. Theſe kinds of manure are of laſting advantage. See the article SAND.

Tanner's bark, laid in a heap, and rotted, is alſo an excellent manure, eſpecially for ſtiff cold land, and one load of it will improve the ground more, and laſt longer than two loads of the richeſt dung: when this manure is laid on graſs, it ſhould be done ſoon after Michaelmas, that the winter rains may waſh it into the earth: and where it is uſed for corn-land, it ſhould be ſpread on the ſurface before the laſt plowing, that it may be turned down for the fibres of the corn to reach it in the ſpring. Rotten vegetables of moſt ſorts, alſo greatly enrich land, ſo that where other manure is ſcarce, theſe may be uſed with great ſucceſs: thus the weeds of ponds, lakes, a

BRITISH MUSEUM

Stereographic Projection on the Plane of the Equator
Fig. 1.



Orthographic Projection on the Plane of the Equator
Fig. 2.

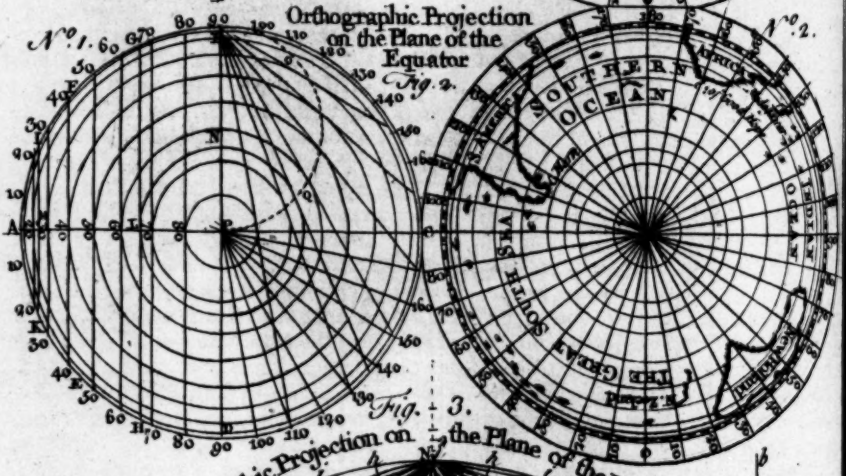
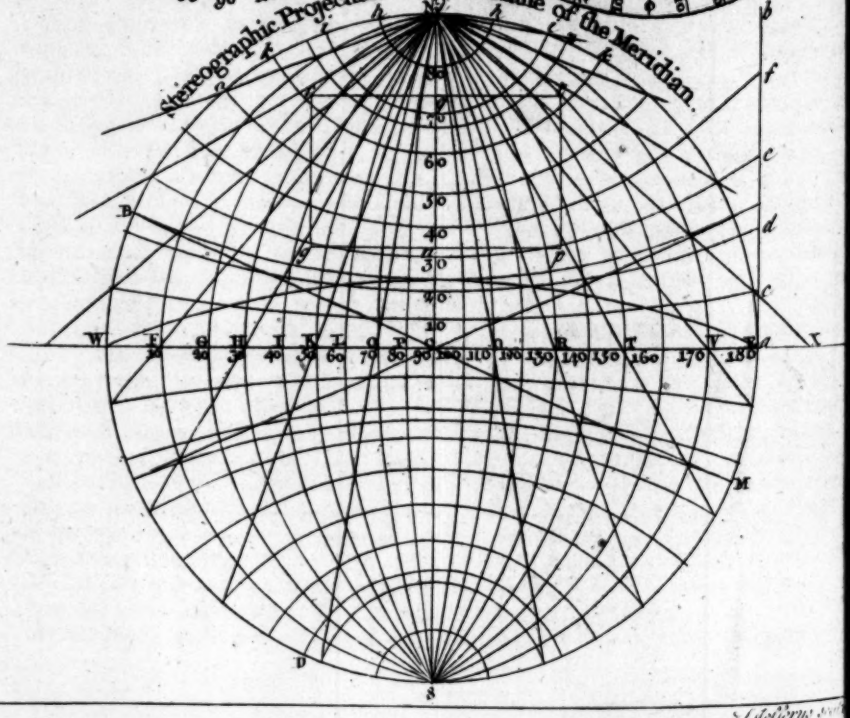


Fig. 3.
Stereographic Projection on the Plane of the Meridian.



and ditches, being dragged out just as they began to flower, and laid on heaps to rot, will make excellent manure: but it is to be observed, that in rotting these vegetables, it will be proper to mix some earth, mud, or any other such like substance with them, to prevent their taking fire in their fermentation; it will also be proper to cover the heaps with earth, mud, or dung, to detain the salts, otherwise many of the finer parts will evaporate in fermenting. The refuse of kitchen-gardens, when laid on heaps and rotted, will also afford good manure for corn-land: and also fern mowed down while it is green and tender, and laid on heaps to rot, will make excellent manure; and by frequently mowing it, this troublesome plant will be destroyed. The ashes of all kinds of vegetables are also good manure for land, so that where the ground is over-run with bushes, brambles, *&c.* if they are grubbed up in summer, spread abroad to dry, and then consumed to ashes, and spread over the land, they will greatly improve it. Rotten wood, and saw-dust, when rotted, are a very good manure for strong land, as are also bones, horns, shells, woollen rags, *&c.* and whatever serves to loosen its parts.

MANUSCRIPT, in matters of literature, denotes a written book, in contradistinction to a printed one. See BOOK.

MANWORTH, in law, the price anciently set upon a man's life, which was paid to the lord for killing his villain.

MAP, a plain figure, representing the surface of the earth, or a part thereof, according to the laws of perspective. See the article PERSPECTIVE.

In maps, these three things are essentially requisite. 1. That all places have the same situation and distance from the great circles therein, as on the globe, to shew their parallels, longitudes, zones, climates, and other celestial appearances, 2. That their magnitudes be proportionable to their real magnitudes on the globe. 3. That all places have the same situation, bearing and distance, as on the earth itself.

The true chart performs the first and last of these very exactly, but fails extravagantly in the second; and, indeed, no kind of projection yet found can exhibit more than two of them at once, by reason of the great difference between a plane and convex superficies.

Maps are not always to be used as they lie before us, for sometimes any part is uppermost; but, generally, the top is the north part, the bottom the south, the right hand the east, and the left hand the west, and marked with these words, or latin ones of the same import. There is also inscribed a compass, pointing to all the quarters of the world, the north one being marked with a flower de luce.

The degrees of longitude are always numbered at top and bottom, and the degrees of latitude on the east and west sides.

In all right-lined, and general circular maps, except those of Wright's Projection, the degrees of latitude on the sides are of an equal breadth; and in all circular and right-lined maps, except the said Wright's, and the plain charts, the degrees of longitude are unequal.

In general maps, the circles corresponding to those in the heavens are inscribed, *viz.* the equator is expressed by a straight east and west line; and the first meridian, the polar circles, the tropics, and the other meridians and parallels, which are drawn at every five or ten degrees, intersect each other at right angles.

In several maps there are three sorts of scales of miles, according to the various computations in different parts of the same country, *viz.* greater, lesser and mean; besides which, there are often affixed scales of other country measures, as Dutch, French, Italian, *&c.*

As for other matters, regarding maps in general, the characters used to denote cities, rivers, roads, boundaries, and the like, they are usually explained in the maps themselves. We shall therefore proceed to shew the several methods of constructing the geographical maps in order: and first of the

Stereographic projection of MAPS upon the plane of the equator, the eye being supposed placed in one of the poles. To do this proceed thus: from P, the pole, (plate CLXVII. fig. 1. n° 1.) draw a circle A B C D, of what circumference you please, to represent the equator, which cross with two diameters A C, B D, dividing it into four quadrants, then subdivide each of these into nine, and these again into ten more, if the largeness will admit; and from D, the point of intersection of the first meridian B D, number every tenth degree with figures, both on the right hand and on the left, till they meet in the opposite point B 180; so will the map be divided into east and west longitude. Then from the pole draw

right lines to every ſuch tenth degree in the equator, as is done in the quadrant D C; and theſe will repreſent the meridians, and the figures will ſhew the longitude.

To delineate the parallels of latitude, from B draw lines to every tenth degree in the quadrant A D; and where they interſect the diameter P A, through thoſe points muſt circles be deſcribed from the center P, and then numbered from the equator towards the pole with 10, 20, 30, &c. Thus you have the meridians and parallels projected; and ſince the polar circles and tropics are only parallels, at a certain diſtance from the pole and equator, *viz.* 23° 30′; therefore ſet off 23° 30′, on the equator from D to E, as alſo from C to F; then through the points H and I, where the lines B E and B F interſect A C, deſcribe double circles to diſtinguiſh them from other parallels. So ſhall P H repreſent the arctic circle, and P I the tropic of cancer. The lineaments of your map being thus projected, places may be inſerted by help of a table of latitudes and longitudes, as repreſented *ibid.* n° 2. But in theſe maps, the mutual bearings and diſtances of places cannot be determined; alſo countries near the equator take up more room than proportionably they ſhould.

Orthographic projection of MAPS upon the plane of the equator, wherein the eye is ſuppoſed to be at an infinite diſtance in the axis, two hundred ſemi-diameters at leaſt; by which means the places about the pole, which may be diſcerned at any diſtance, will have a larger projection than thoſe nearer the equator; juſt the reverſe of what happened in the former projection.

In this projection, the equator muſt be drawn and divided, and meridians delineated in the ſame manner as taught above; then to deſcribe the parallels proceed thus: from either ſide of the firſt meridian A P (plate CLXVII. fig. 2, n° 1.) draw right lines through the correſponding degrees, or every tenth degree of the quadrants A B, A D, parallel to the diameter B D; and through the points where theſe cut the meridian A P, draw circles repreſenting the parallels, numbering them with 10, 20, 30, &c. from A to the pole P, to ſhew the degrees of latitude. To delineate the polar circles and tropics, ſet off from B to G, and from D to H 23° 30′; as alſo from A to I, and from A to K; and drawing lines between each, through the points of interſection of the firſt meridian A P, draw circles: then P L will repreſent the polar circles, and P M the tropic of cancer. The ecliptic may be projected, and places laid down in the ſame manner as above; *ibid.* n° 2.

This kind of the equatorial projection, ſhews the true decreaſe of the degrees of the equinoctial, or of longitude, in every parallel of latitude: the circumpolar regions may be delineated better in this than in the former projection; and ſo may Tartary, and the north parts of Europe, as Sweden, Norway and Muſcovy.

But beſides the inconveniencies, already mentioned, attending theſe two kinds of projection, there is no bringing all the places in the eaſtern or weſtern hemiſphere into leſs than two hemiſpheres, ſo as to expreſs Europe, Aſia and Africa, or America by itſelf, in one map. Geographers have therefore invented another way, ſomewhat more difficult indeed, but much more natural and uſeful, *viz.*

Stereographic projection of MAPS, upon the plane of the firſt meridian, wherein you muſt conceive the eye to be ſituated in that point of the equator, which is cut by the meridian 90° diſtant from the firſt meridian. In this projection the equator is a right line, as is alſo the meridian 90° diſtant from the prime one, and cutting it in the point of the eye's poſition: but the other meridians, and all the parallels are arches of circles, and the ecliptic an ellipſis.

The method is this: deſcribe the circle N E S W, (plate CLXVII. fig. 3.) repreſenting the firſt meridian; croſs it with two diameters at right angles, and W C E ſhall repreſent the equator, W the weſt part, and E the eaſt; and the other diameter N G S will be the meridian, 90° diſtant from the firſt, N repreſenting the north and S the ſouth pole, and C the point where the eye is ſuppoſed to be.

To delineate the meridians, proceed thus: from N draw lines through each tenth degree, or each degree, if you think fit, of the quadrants W S or S E, which ſhall cut the quadrant of the equator W C in F, G, H, I, K, L, O, P; or, to avoid ſcreening in your paper, make a point in the line where the ſide of the ruler cuts it. You need only divide one quadrant, becauſe the diviſions in it may be transferred into the lines C N, C E and C S, which will ſave the trouble of their particular diviſions. Thus are the points in the equator through

through which the meridians are to pass; as, also, those points in the perpendicular meridian, determining the ambit of the parallels, found out. The centers of all those meridians, whose distance from the first meridian, NWSE, does not exceed 45°, may be found out in the line CE, reckoning every second degree from the point C, for the centers of each degree from the point W. By the same proportion, we must take every twentieth degree, or point, from C, in the line CE, for centers to each tenth degree or point, from W, in the line WC: therefore Q will be the center of F, R of G, T of H, and V of I. But because the centers of the meridians, exceeding 45°, lie without the circumference of the first meridian, in the line CE extended; therefore, laying the ruler upon N, and every second degree, or, according to the projection upon every twentieth degree of the quadrant NE, make points in the extended line CE, which shall be the centers of all the other meridians where the edge of the ruler cuts it. Thus X will be the center of K, the meridian 50° distant from the primitive, and so on. And, in the like manner, may the meridians be described through the points in the line CE, by transferring the center-points of CE to CW continued.

The points for the projection of the parallels being already marked in the lines CN and CS, to find the centers of these points, erect a perpendicular at E, as *ab*; and from C, through each tenth degree of the quadrant NE, draw secant lines to cut the said perpendicular in *c*, *d*, *e*, *f*, &c. Then take the distance C*c* in your compasses, and transfer it upon the line CN, continued, from C to 1, which will be the center to the parallel *b* 80 *b*; C*d* transferred to C2 will give the center of the parallel *i* 70 *i*; C3 = C*e* will be the center of *k* 60 *k*; and so on for the rest of the parallels.

To project the tropics and polar circles, set off, on each side the equator and poles, 23° 30′; then draw a secant from C, through these points, and transfer the point of intersection with the tangent line, as before, for the centers of those circles. The construction of the parallels of the other hemisphere is performed in the same manner, *viz.* by transferring the centers found by the intersection of the secants with the tangents, to the line CS, continued.

There are two ways of projecting the ecliptic: for supposing C to be the first point of aries, and the eye to be in the vertical colure, it will be represented by a right line, drawn from the beginning of cancer B, through the beginning of aries C, to the beginning of capricorn M; which being graduated like the equator, the degrees of each sign are to be marked upon it. To do this, cross the ecliptic BM with a line at right angles, drawn from the opposite points of the polar circles in the meridian, Z, D; divide the quadrant BD into nine equal parts, each containing 10°; and laying a ruler upon Z, and upon each division of the quadrant BD, cut the line BM as you did the equator. But all this trouble may be spared, by transferring the divisions of the equator upon the ecliptic BM.

The other way of projecting the ecliptic, where the eye is supposed to be in the solsticial colure, is the same as in all maps of the hemispheres, where it cuts the points of the intersection of the first meridian and equator, at W and E; and the third point is that wherein the tropic BAY cuts the meridian NCS at A.

The construction is now ready for inserting the places in the maps, which may be done by the help of a table of longitudes and latitudes, as in the former methods.

The advantages of this projection are these: 1. It very agreeably represents the hemisphere intercepted between the two poles, with all the parts entire. 2. It shews the longitudes, latitudes and distances of places from all the great circles, exactly as on the globe itself.

Its defects are also two. 1. That the degrees of the equator, meridians and parallels, are unequal, except those of the first meridian, encreasing gradually the nearer they approach to the first or prime meridian; and consequently the parts about C are less, and those about A and C greater than they ought: and, in the same manner, the places about the poles bear an unequal proportion to those nearer the equator. 2. The course and distance between places, are neither with ease or exactness found in this projection.

If you would project a map of any particular portion of the earth, less than an hemisphere, you must make the projection proportionable to the extent of the map you intend to draw, and then cut out so much of it as is terminated by the greatest degree of longitude and latitude of the country to be projected. For example,

ample, ſuppoſe you would draw a map of Europe, according to this conſtruction, which being laid down as directed above, through the points where the parallels of the greater and leſſer latitude of Europe, *viz.* 72° and 34°, cut N C, draw lines parallel to the equator; and becauſe, in the common maps, Europe includes 93° of longitude, therefore ſet off, *viz.* 46° 30′ from *n* to *g* and from *n* to *p*, and draw *g p* = 93°, the extent of Europe in longitude; then erect perpendiculars on the points *g* and *p*, to ſquare your map; or, to ſave this trouble, ſet off *n g* from *q* to *r*, and from *q* to *t*, and cut out your map accordingly. However, it is beſt to allow a little more room in ſeparating your map from the reſt of the projection to expreſs the ſituation thereof in reſpect of other countries.

Orthographic projection of MAPS on the plane of the meridian, in which the parallels of latitude are all right lines, and all the meridians, except the firſt, ſemi-ellipſes; which conſtruction is formed by ſuppoſing perpendiculars to fall from all points of each hemiſphere on the plane of the firſt meridian.

Thus let NESW, (pl. CLXVIII. fig. 1.) the meridian, be divided, as in the former method, into four quadrants, and each quadrant into 9 or 90 equal parts or degrees: from each tenth degree of the quadrants N W and W S, draw lines to each correſponding tenth degree in the quadrants N E and E S, parallel to the equator W E, and theſe will be the parallels of latitude: and having numbered each parallel on the firſt meridian, and in G N and C S, tranſfer the interſections of theſe parallels with C N or C S into C W and C E, which will give the points in the equator through which the meridians muſt paſs; and number theſe from W towards E, for degrees of longitude.

Then, ſince the meridians are ſemi-ellipſes, you may deſcribe them through the given points, *viz.* the two poles and the diviſions of the equator W E, with elliptical compaſſes; or, by help of a ſector, you may find the points in each parallel of latitude, through which the ellipſes may be formed. The ecliptic, in this projection, will be repreſented by an elliptical or ſtraight line, in the ſame manner as in the former method.

The maps of this conſtruction have this advantage above the preceding methods, that they exhibit the true proportional decreaſe of the degrees of the equator in each parallel; but this advantage is counter-balanced by a great inconvenience, *viz.* the too great contraction of the meridians the nearer they lie to the firſt, which makes this projection unfit for general maps; Africa being the only quarter of the globe that would nearly retain its due figure and dimenſions.

Stereographic projection of MAPS, upon the plane of the horizon, the eye being ſuppoſed in the zenith for the upper hemiſphere, and in the nadir for the lower one. The common method of conſtruction is this: ſuppoſe it were required to deſcribe an horizontal projection for the city of London, in latitude 51° 32′; from L or Z, (plate CLXVIII. fig. 2.) the zenith and London being here the ſame, deſcribe the circle N E S W of what extent you pleaſe; to repreſent the horizon, quarter it, and divide each quarter into 90°; or, to avoid confuſion, divide only one quadrant N W or W S; draw the diameter N S, which let be the firſt meridian, then will W E be the prime vertical, or azimuth of eaſt and weſt. Next take 51° 32′ from the divided quadrant NW, and ſet it off from N to A; then draw a line from W to A, and where the ruler cuts N S make a point, which ſhall repreſent the arctic pole P. Thirdly, take the diſtance of the arch of any of the quadrants as N E, and ſet it off from A to B; and where the line WB cuts the diameter N S that point Q will be the point of the interſection of the meridian with the equator. Fourthly, divide the ſemicircle NAEBS from E, into degrees, the ſame in proportion to thoſe of the quadrant N W and from W to each, or each tenth degree, lay a ruler, and mark where it cuts the line N S, for there will be the points of the interſection of the parallels with the firſt meridian, which fall within the periphery of the projection. But if you would find the oppoſite point of each parallel, in order to delineate them eaſily on the projection, continue the diviſion of the periphery from the equatorial point B, upon the quadrant N W, and draw lines as before through each point to cut the diameter N S continued; then deſcribe circles through the points of equal degrees from the pole P, through 80, 70, 60, *&c.* in the line P S, and 80, 70, 60, *&c.* in the line P N, extended. Thus may all the parallels, tropics, and polar circles be projected.

In the conſtruction of the meridians proceed thus: firſt, through the points W, P, E, draw a circle, the half of which is C P D, and delineate thereon the meridian pro-

BRITISH MUSEUM

Projection of MAPS.

Fig. 1. Orthographic Projection on the Meridian.

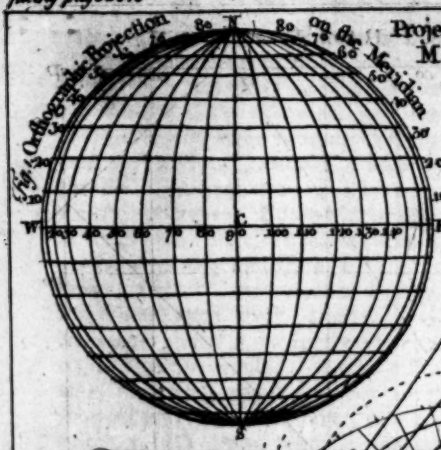


Fig. 3. Azimuth Projection on the Horizon.

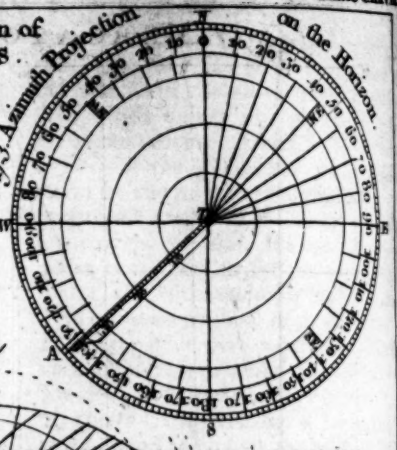
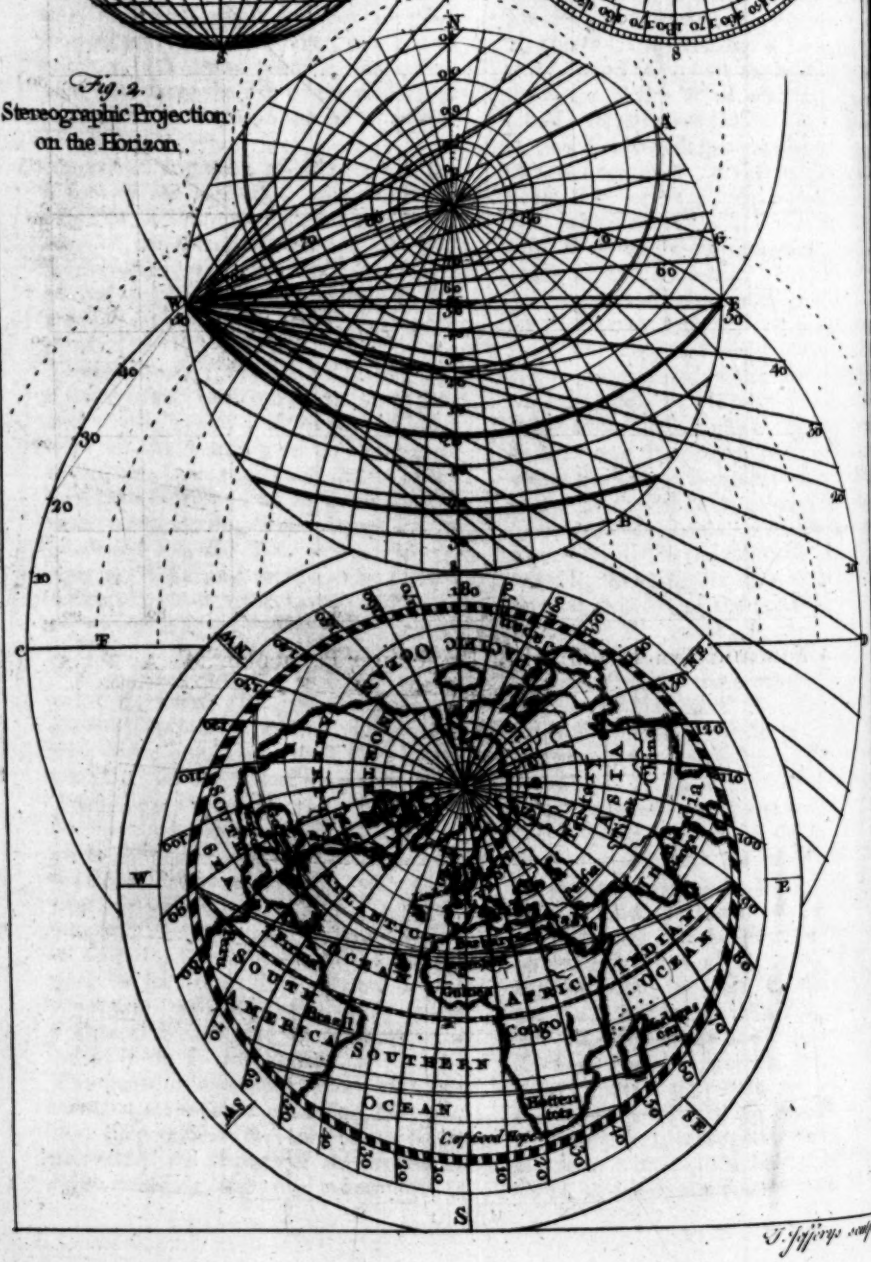


Fig. 2. Stereographic Projection on the Horizon.



J. Seffreys sculp.

facing page 2017

Projection of MAPS. Plate CLXIX

Fig. 1. MERCATOR'S PROJECTION.

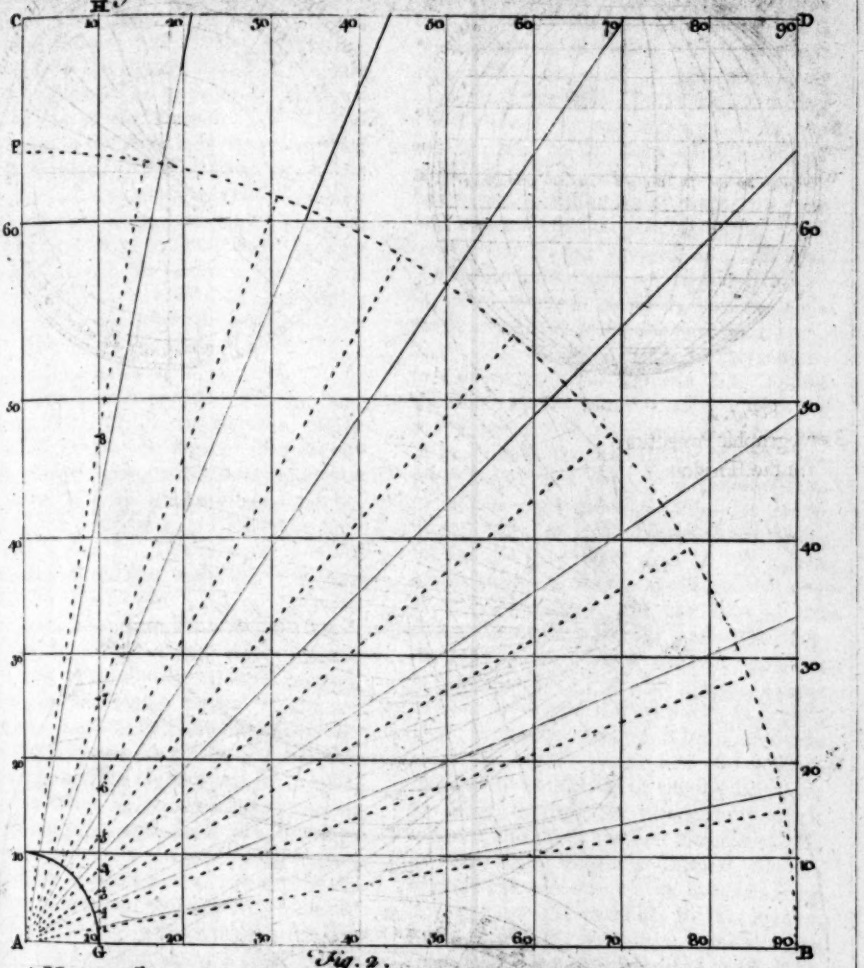
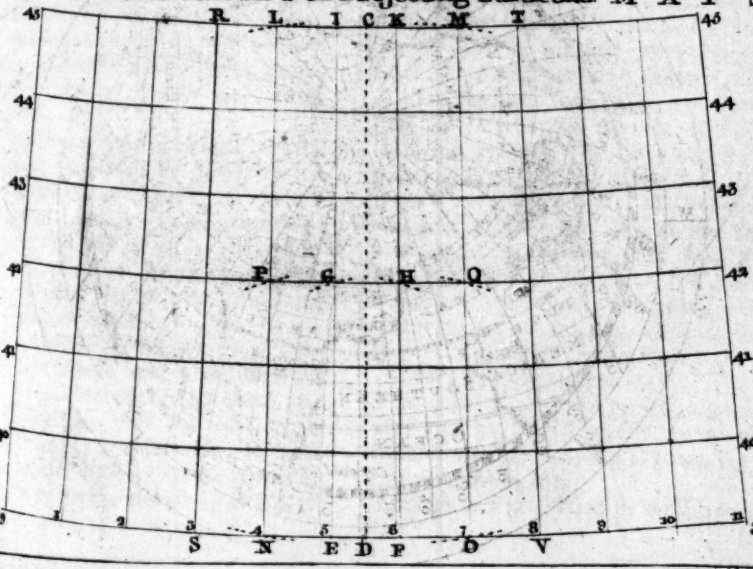


Fig. 2.

A New and Exact method of Projecting Particular MAPS.



J. Jefferys sculp

BRITISH MUSEUM

projection, by dividing it into 360°; then drawing lines from P to every degree, or tenth degree: and, laſtly, deſcribing circles from the centers found in the line CD, continued at both ends, through the diviſion in the diameter WE, and the poles, in the ſame manner as directed in the ſtereographic projection upon the meridian, the parallels excepted, which muſt not be drawn. In deſcribing the meridians, obſerve to draw each through the pole to touch the horizon, which will be the meridians north of the pole. Thus, when you deſcribe the meridian FP, deſcribe at the ſame time FPG; and the ſame holds of all the reſt.

When you have proceeded thus far, deſcribe a circle round the horizon pretty cloſe, to contain the degrees of graduation, which muſt be made between the meridians, and not the parallels, each into ten parts or degrees, to ſhew the longitudes of places. The latitude muſt be graduated on the firſt meridian NS, and numbered from the equator towards either pole, and from the pole backward, towards N. This done, draw a circle with this again, wide enough to hold the figures belonging to the numbered degrees. Laſtly, deſcribe two more circles, the firſt near the former, and divide the quadrants into eight equal parts each, or thirty-two in all, to repreſent the points of the compaſs, and ſhew the bearings of places in reſpect of London the center. The outward graduated circles ſupply the place of azimuths, to draw which would occaſion confuſion in the ſcheme; for if a central rule be fixed upon a pivot in the center, or place repreſenting London, and graduated with the ſame diviſions as ZN, by moving it about to any place, we may eaſily diſcover not only the bearing but the diſtance of that place from London.

All theſe circles are expreſſed in the lower figure, in which ſo much of the earth is deſcribed as is contained within the horizon of London, as a ſpecimen of the nature and uſe of this projection. Thus your projection being completed, it is eaſy to inſert the places, according to their latitudes and longitudes.

Horizontal projection of MAPS, with azimuth lines. Thoſe who are unwilling to take the trouble of laying down the former projection, and are content to know the bearings and diſtances of places from the center, without the longitude or latitude, may divide the circle NESW (plate CLXVIII. fig. 3.) into degrees and points of the compaſs; where NS repreſents the meridian, WE the eaſt and weſt line, and Z the zenith, or place in the center. This done, you may put London, or any other place in the center; and by the help of the ſcale of equal parts ZA, fixed in the center, the bearings and diſtances of places may be laid down from the globe or maps.

Mercator's or Wright's projection of MAPS. The principles upon which this admirable contrivance is founded, have been already explained under the article CHART. Now to apply this method to the projection of maps, draw the line AB, (plate CLXIX. fig. 1.) and divide it into as many degrees as your map is to contain in longitude, ſuppoſe 90°. At the extremities A and B raiſe perpendiculars, to which draw parallel lines at every ſingle, fifth, or tenth degree of the equator for the meridians; as in the figure where they are drawn at every tenth degree. This done, put one foot of the compaſſes in the point A, and extending the other to the point in the firſt meridian in the equator G; or, for greater exactneſs, to ſome more diſtant point, as B 90°. Deſcribe the quadrant FB, which divide into nine equal parts, and draw lines from A to each point of the diviſion; or, to avoid ſcoring the paper, only mark where a ruler cuts the firſt meridian GH, at every tenth degree's diſtance. Laſtly, becauſe the diſtances of the parallels from one another are marked, by this means, in the line GH, you muſt transfer them from that line to the ſide lines AC, BD, after the following manner. 1. Set one foot of the compaſſes in A, and extending the other to the firſt point above G, marked 1, transfer this diſtance, *viz.* A 1, to the lines AC, BD, and draw a line parallel to the equator AB, for the tenth parallel. 2. Next transfer the diſtance A 2 into the lines AC, BD, from the tenth parallel to the twentieth, which is to be drawn. 3. In the ſame manner, the diſtances A 3, A 4, A 5, *&c.* laid off upon the lines AC, BD, from the immediately preceding parallels, *viz.* 20, 30, 40, *&c.* will ſucceſſively point out where the parallels, 30, 40, 50, *&c.* are to be drawn.

This is the geometrical projection, which may alſo be laid down by means of a ſcale or table of meridional parts, by the line of ſecants, *&c.*

Though this projection be moſt true, yet hath

hath it this disadvantage, of extorting the figure, magnitude and proportion of countries; we shall therefore add a more exact method of projecting particular maps, wherein the squares are so projected as to form equal diagonals throughout.

A new, easy, and exact method of projecting particular MAPS. Suppose you would draw a map of some part of the earth, containing 6° of latitude, *viz.* from 39° to 45°, let the longitude be what it will. 1. Draw the line E F, (plate CLXIX. fig. 2.) and in its middle raise the perpendicular D C, which divide into six equal parts, or degrees of latitude; and through C, draw a line parallel to E F. 2. Divide a degree into ten, or if large enough to admit it, into sixty equal parts; and in the table for decreasing longitude, find the content of a degree of longitude in the latitude of 39°, *viz.* 46.62 miles. 3. From the degree so divided, take the parts 46.62; divide that distance, and from D set off one half to E, and the other half to F. 4. Find the content of a degree in latitude 45°, *viz.* 42.43 miles; take that distance from the scale of the degree; divide it; and from the point C lay one half to I, and the other half to K. 5. Draw straight lines from I to E and from K to F; divide them in like parts with C D, and through those marks draw parallel lines.

Thus I K F E is a projection for one degree of longitude, including six degrees of latitude; which may be transferred upon the paper, as often as there is occasion, by the following method.

1. If the compasses be large enough, or the projection will admit it, take the distance from E to K, or from F to I, and setting one foot first in E and then in F, describe the arches L and M. In like manner set one foot first in I and then in K, and with the same extent draw the arches N and O: take the distance with another pair of compasses, between E and F, and set it off from E to N, and from F to O: likwise set the distance between I and K, from I to L, and from K to M; draw lines between L and N, and M and O; divide them into degrees, and draw parallels from those points to the corresponding points in the meridians I E and K F. And, after the same manner, may meridians and parallels be drawn, to as many degrees of longitude as your map contains.

2. If the map be very large, so that the compasses cannot extend to the farthest degree, or from F to I, then you may draw one or more diagonals, as you can conveniently, at once; and then proceed to draw the rest. Thus, when you have laid down the squares P G E N *(ibid.)* and H Q O F, in the same manner as directed above, go on to draw L I G P and K M Q H, by the same method.

In this projection, the diagonals being all equal, places lying in the remotest longitudes or diagonals, are as truly exhibited as those near the middle, and consequently their distances conformable to one common measure; so that the compasses, extended between any two places, and applied to the scale, give the distance without more ado. The bearings too will be very conspicuous by means of a compass drawn on a corner or side of the map.

The scale on the sides, is that by which the distances are measured; but it must be graduated on one of the meridians, and not on the out lines of the map, as is commonly done.

Printed maps, on being imported from abroad, pay a duty of 15 s. $4\frac{80}{100}$ d. per ream; and draw back, on exportation, 13 s. 6 d. and, if in frames, for each map 1 s. $2\frac{36\frac{1}{4}}{100}$ d. the drawback being 1 s. $\frac{9\frac{3}{4}}{100}$ d.

MAPLE, *acer*, in botany, a genus of the octandria monogynia, class of plants, the flower of which is composed of five oval petals; the fruit consists of a number of capsules, which grow together at the base and are compressed, roundish, and each terminated by a very large membranaceous ala; the seeds are single and roundish.

MAPPARIUS, in roman antiquity, the officer, who gave the signal to the gladiators, to begin fighting; which he did by throwing an handkerchief, that he had received from the emperor or other magistrate.

MARACAIBO, a city and port-town in the territory of Venezuela, situated on the west side of the lake of Maracaibo, in Terra Firma, in South America: west long. 70°, and north lat. 10° 45′.

MARANA, or MARAGNA, a city of the province of Romania, in european Turky, east long. 26°, and north lat. 40° 36′.

MARANO, a town of the province of Friuli, in the territory of Venice, thirty miles north-east of that capital.

MARANTA, in botany, a genus of the monandri-

monandria monogynia claſs of plants, with a monopetalous ringent flower, the tube of which is oblong, compreſſed, crooked, and oblique, and its limb ſexifid; the fruit is a roundiſh capſule, ſomewhat obſcurely trigonal, containing a ſingle, hard, and rugoſe ſeed.

MARASMUS, among phyſicians, denotes an atrophy or conſumption, in its laſt and moſt deplorable ſtage. See the article CONSUMPTION.

MARAVEDI, a little ſpaniſh copper-coin. See the article COIN.

MARBLE, *marmor*, in natural hiſtory, a genus of foſſils; being bright and beautiful ſtones, compoſed of ſmall ſeparate concretions, moderately hard, not giving fire with ſteel, fermenting with and ſoluble in acid menſtrua, and calcining in a ſlight fire.

The colours of marbles being a very obvious and ſtriking character, they are arranged according to them, in the following diviſions. 1. Of the white plain marbles there are two ſorts; the parian marble of the antients, and ſtatuary marble of the moderns, an extremely bright and elegant marble; and the carara marble, a very fine marble, more compact and cloſe than the former, but leſs bright. 2. Of the plain yelloviſh marbles there is only one ſort, which is a hard, pale yellow, and gloſſy marble, found in many parts of Italy. 3. Of the bluiſh and black marbles there are a great many ſpecies, as the chian marble, baſaltes, &c. 4. Of the plain green marbles there is only one kind, the lacedemonian marble of the antients. 5. The pale coloured or whitiſh brown, commonly called darby-marble. 6. The green marbles with ſhells. 7. The black coralloide marble, with and without ſhells. 8. Of the white variegated marbles there are a great many ſpecies, variegated with purple, brown, red, blue, &c. 9. Of the brown variegated marbles there are likewiſe ſeveral ſorts, ſome with red veins, others with white, black, or brown veins. 10. Of the yellow veined and variegated marbles, ſome are veined with purple, and others with blue. 11. Of the black variegated marbles, ſome are veined with white, and others with blue, yellow, red, &c. 12. The green variegated marbles are likewiſe diſtinguiſhed by the colour of their veins. 13. The grey ſpotted marbles are variegated, ſome with black, and others with green ſpots. 14. The red variegated marble is the brocatello of the Italians, with white and gold veins.

Colouring of MARBLE. The colouring of marbles is a nice art, and in order to ſucceed in it, the pieces of marble, on which the experiments are tried, muſt be well poliſhed, and clear from the leaſt ſpot or vein. The harder the marble is, the better it will bear the heat neceſſary in the operation; therefore alabaſter, and the common ſoft, white marble, are very improper to perform theſe operations upon.

Heat is always neceſſary for the opening the pores of the marble, ſo as to render it fit to receive the colours; but it muſt never be made red hot, for then the texture of the marble itſelf is injured, and the colours are burnt, and loſe their beauty. Too ſmall a degree of heat is as bad as too great; for, in this caſe, though the marble receive the colour, it will not be fixed in it, nor ſtrike deep enough. Some colours will ſtrike, even cold, but they are never ſo well ſunk in as when a juſt degree of heat is uſed. The proper degree is that which, without making the marble red, will make the liquor boil upon its ſurface. The menſtruums uſed to ſtrike in the colours muſt be varied according to the nature of the colour to be uſed. A lixivium made with horſe's or dog's urine, with four parts quick-lime, and one part pot-aſhes, is excellent for ſome colours; common lye of wood-aſhes does very well for others: for ſome, ſpirit of wine is beſt; and finally, for others, oily liquors, or common white wine.

The colours which have been found to ſucceed beſt with the peculiar menſtruums, are theſe: ſtone-blue diſſolved in ſix times the quantity of ſpirit of wine, or of the urinous lixivium; and that colour which the painters call litmouſe, diſſolved in common lye of wood-aſhes. An extract of ſaffron, and that colour made of buckthorn-berries, and called by the painters ſap-green, both ſucceed well diſſolved in urine and quick lime, and tolerably well in ſpirit of wine. Vermillion, and a fine powder of cochineal, ſucceed alſo very well in the ſame liquors. Dragon's blood ſucceeds very well in ſpirit of wine, as does alſo a tincture of logwood in the ſame ſpirit. Alkanet-root gives a fine colour, but the only menſtruum to be uſed for this is oil of turpentine; for neither ſpirit of wine, nor any lixivium, will do with it. There is another kind of ſanguis draconis, called dragon's

blood

blood in tears, which, mixed with urine alone, gives a very elegant colour. Beſides theſe mixtures of colours and menſtruums, there are ſome colours which are to be laid on dry and unmixed. Theſe are dragon's blood, of the pureſt kind, for a red; gamboge for a yellow; green wax for a green; common brimſtone, pitch and turpentine for a brown colour. The marble, for theſe experiments, muſt be made conſiderably hot, and then the colours are to be rubbed on dry in the lump. Some of theſe colours, when once given, remain immutable; others are eaſily changed or deſtroyed. Thus the red colour given by dragon's blood, or by a decoction of logwood, will be wholly taken away by oil of tartar, and the poliſh of the marble not hurt by it.

A fine gold-colour is given in the following manner: take crude ſal armoniac, vitriol and verdegreaſe, of each equal quantities; white vitriol ſucceeds beſt, and all muſt be thoroughly mixed in fine powder.

The ſtaining of marble to all the degrees of red or yellow, by ſolutions of dragon's blood or gamboge, may be done by reducing theſe gums to powder, and grinding them, with the ſpirit of wine, in a glaſs mortar; but for ſmaller attempts, no method is ſo good as the mixing a little of either of theſe powders with ſpirit of wine in a ſilver-ſpoon, and holding it over burning charcoal. By this means a fine tincture will be extracted, and with a pencil dipped in this, the fineſt traces may be made on the marble, while cold, which, on the heating it afterwards, either on ſand, or in a baker's oven, will all ſink very deep, and remain perfectly diſtinct in the ſtone. It is very eaſy to make the ground colour of the marble red or yellow by this means, and leave white veins in it. This is to be done by covering the places where the whiteneſs is to remain with ſome white paint, or even with two or three doubles only of paper, either of which will prevent the colour from penetrating in that part. All the degrees of red are to be given to marble by means of this gum alone; a ſlight tincture of it, without the aſſiſtance of heat to the marble, gives only a pale fleſh colour, but the ſtronger tinctures give it yet deeper; to this the aſſiſtance of heat adds yet greatly; and finally, the addition of a little pitch to the tincture gives it a tendency to blackneſs, or any degree of deep red that is deſired.

A blue colour may be given alſo to marble by diſſolving turnſol in a lixivium of lime and urine, or in the volatile ſpirit of urine; but this has always a tendency to purple, whether made by the one or the other of theſe ways. A better blue, and uſed in an eaſier manner, is furniſhed by the canary-turnſol, a ſubſtance well known among the dyers: this needs only to be diſſolved in water, and drawn on the place with a pencil; this penetrates very deep into the marble, and the colour may be increaſed by drawing the pencil wetted afreſh ſeveral times over the ſame lines. This colour is ſubject to ſpread and diffuſe itſelf irregularly; but it may be kept in regular bounds, by circumſcribing its lines with beds of wax, or any other ſuch ſubſtance.

Poliſhing of MARBLES is performed by firſt rubbing them well with a free-ſtone, or ſand, till the ſtrokes of the axe are worn off, then with pumice-ſtone, and afterwards with emery.

Arundel-MARBLES, antient marbles with a chronicle of the city of Athens inſcribed on them, many years before our Saviour's birth; preſented to the univerſity of Oxford by Thomas earl of Arundel, whence the name.

MARBLING, in general, the painting any thing with veins and clouds, ſo as to repreſent thoſe of marble.

Marbling of books or paper is performed thus: diſſolve four ounces of gum arabic into two quarts of fair water; then provide ſeveral colours mixed with water in pots or ſhells, and with pencils peculiar to each colour, ſprinkle them by way of intermixture upon the gum-water, which muſt be put into a trough, or ſome broad veſſel; then with a ſtick curl them or draw them out in ſtreaks, to as much variety as may be done. Having done this, hold your book or books cloſe together, and only dip the edges in, on the top of the water and colours, very lightly; which done, take them off, and the plain impreſſion of the colours in mixture will be upon the leaves; doing as well the ends as the front of the book in the like manner.

After the ſame manner you may marble paper, by dipping it on the ſurface, as alſo linen cloth, *&c.*

Marbling a book on the covers is performed by forming clouds with aqua fortis, or ſpirit of vitriol mixed with

and afterwards glazing the covers. See the article BOOK-BINDING.

MARCASITES, *marchaſitæ*, in natural hiſtory, are defined to be compound inflammable metallic bodies, of a hard and ſolid ſubſtance, of an obſcurely and irregularly foliaceous ſtructure, of a bright glittering appearance, naturally conſtituting whole ſtrata, though ſometimes found in detached maſſes; very freely giving fire with ſteel; not fermenting with acid menſtruums; and when put into the fire, yielding a blue ſulphureous flame, and afterwards calcining into a purple powder. There are only three known ſpecies of this genus: 1. The ſilver-coloured marcaſite, found in vaſt abundance in lead and tin-mines. 2. The gold-coloured marcaſite. 3. The heavy pale-white marcaſite.

Marcaſites were at firſt ſuppoſed to be almoſt all pure gold or ſilver, according to their colour; but experience has ſhewn, that if they contain any metal at all, no method has hitherto been found of working them to advantage. In Germany, indeed, they extract ſulphur and vitriol from the ſilver marcaſite, which two ſubſtances are always contained in it; and beſides theſe, it has uſually a quantity of arſenic. It has been recommended as a ſtyptic, after being calcined; but as the arſenic may not be all carried off by that operation, its uſe as a medicine ſeems extremely dangerous.

MARCGRAVE, or MARGRAVE, a degree of honour in Germany anſwering to our marquis. See MARQUIS.

MARCGRAVIA, in botany, a genus of the polyandria-monogynia claſs of plants, the corolla whereof conſiſts of a ſingle petal, of a conico-oval figure; and its fruit is a globoſe berry, with a ſingle cell, containing a great number of very ſmall ſeeds.

MARCH, in chronology, the third month of the year, conſiſting of thirty-one days. See the articles MONTH and YEAR.

MARCHANTIA, in botany, a genus of the cryptogamia claſs of plants, the corolla of which is monopetalous, turbinated, and ſhorter than the cup; in the lower cavity of which there are contained ſeveral naked ſeeds, of a roundiſh but compreſſed figure.

MARCHE, a territory of Lyonois, in France, having Berry on the north, Bourbonois and Auvergne on the eaſt, Limoſin on the ſouth, and Poictou on the weſt.

MARCHE is alſo a town of Lorrain, ſubject to France: eaſt longitude 5° 45′, north latitude 48° 10′.

MARCHIENNES, a town of the auſtrian Netherlands, on the confines of Namur, three miles weſt of Charleroy: eaſt long. 4° 20′, north lat. 50° 26′.

MARCHPURG, a town of Germany, in the circle of Auſtria and dutchy of Stiria: weſt long. 15° 50′, north lat. 47°.

MARCIONITES, chriſtian heretics in the IId century, thus denominated from their leader Marcion, who maintained, that there were two principles or Gods, a good and a bad one. Origen affirms, that he held there was a God of the jews, a God of the chriſtians, and a God of the gentiles. It is ſaid that he denied the reſurrection of the body, condemned marriage, and taught that our Saviour, when he deſcended into hell, diſcharged Cain, the Sodomites, and other impious wretches out of that place of torment. He rejected all the Old Teſtament, and received only part of St. Luke's Goſpel, and ten of St. Paul's Epiſtles, in the New.

MARCOSIANS, a ſect of chriſtian heretics in the IId century, ſo called from their leader Marcus, who repreſented the ſupreme God as conſiſting not of a trinity, but a quaternity, *viz.* the ineffable, ſilence, the father, and truth. He held two principles, denied the reality of Chriſt's ſufferings, and the reſurrection of the body, and had the ſame fancies concerning the æons as Valentinus. See the articles ÆON and VALENTINIANS.

The marcoſians, it is ſaid, made pretences to greater perfection than either St. Peter or St. Paul; and being perſuaded that nothing could hinder their ſalvation, freely indulged themſelves in the practice of vice.

MARDIKE, a port-town of french Flanders, four miles weſt of Dunkirk.

MARDIKERS, or TOPASSES, a mixed breed of Dutch, Portugueſe, Indians, and other nations, incorporated with the Dutch at Batavia, in the Eaſt Indies.

MARE, the female of the horſe-kind. See the article HORSE.

Such mares as are deſigned for breeding, ought to be as free from defects as poſſible, and ſhould, no more than the ſtallions, have either moon-eyes, watery eyes, or bloodſhot-eyes; they ſhould have no ſplint, ſpavin, or curb, nor any natural imperfection, for the colts will take after them: but choice ſhould be made of the beſt and ableſt, the moſt high ſpirited, beſt coloured, and fineſt ſhaped;

and the natural defects that may be in the ſtallion, ſhould be amended in the mare, as well as that which is amiſs in the mare ſhould be amended in the ſtallion.

As for her age, ſhe may be covered when three years old; but the moſt convenient time is after four, when ſhe will nouriſh her colt beſt; and though ſhe may breed till ſhe is thirteen, yet ſhe is not fit for it when ſhe is paſt ten, for the colt of an old mare is commonly heavy. Before a mare is covered, ſhe ſhould be in the houſe about ſix weeks, during which time ſhe ſhould be well fed with good hay and oats well ſifted; and in order to render her conception the more certain, near a quart of blood may be taken from each ſide of her neck, about five or ſix days before covering. Another method to bring a mare in ſeaſon, and make her retain, is to give her, for the ſpace of eight days before you bring her to the horſe, about two quarts of hemp ſeed in the morning, and as much at night; and if ſhe refuſes to eat it, to mingle it with a little bran or oats, or elſe to let her faſt for a while: and if the ſtallion alſo eat of it, it will greatly contribute to generation.

Mares go with foal eleven months and as many days as they are years old, and therefore the propereſt time for covering them is in the beginning of June, that ſhe may foal the May following, when there will be plenty of graſs, which will afford the mares a great abundance of milk, for nouriſhing their foals: but a mare ſhould never be covered while ſhe is bringing up her foal, becauſe the foal to which ſhe is giving ſuck, as well as that in her belly, will be prejudiced by it, and ſhe herſelf ſooner ſpent. After covering, let her, for three weeks or a month, have the ſame diet as before, and be kept clean in the ſtable till the middle of May, with her feet well pared and thin ſhod: take her in again about the latter end of September, if not before, and keep her to the end of her foaling. If ſhe cannot readily bring forth, hold her noſtrils ſo as to ſtop her taking wind; and if that will not do, diſſolve madder, to the quantity of a walnut, in a pint of ale, and give it her warm. In caſe ſhe cannot void her ſecundine, or after-burden, boil two or three handfuls of fennel in running water, then put half a pint of that liquor into as much ſack, or, for want thereof, into a pint of ale, with a fourth part of ſallad oil, mixed together, and pour it lukewarm into her noſtrils, holding them cloſe for ſome time. Otherwiſe give her green wheat, or rye, the laſt of which is beſt.

If the mare has but little milk, boil as much as you can get from her, with the leaves of lavender and ſpike, and bathe the udder with it warm, till the knobs and knots are diſſolved. She ſhould now drink only white water, which is bran put into water; give her alſo ſweet maſhes; and a month after foaling let her have a maſh with ſome brimſtone or ſaffron in it.

MARGA, MARLE, in natural hiſtory. See the article MARLE.

MARGARETTA, one of the largeſt of the Leeward-iſlands; it is about 50 miles long, and twenty four broad, and is ſituated ſixty miles north of the continent of Paria, or New Andaluſia, in South America: weſt long. 64°, and north lat. 11° 30′.

MARGARITA, the PEARL, in natural hiſtory. See the article PEARL.

MARGATE, a port-town of Kent, in the iſle of Thanet, 12 miles north of Deal.

MARGENTHEIM, or MERGENTHEIM, a city of Germany, in the circle of Franconia: eaſt long. 9° 40′, and north lat. 49° 32′.

MARIENBURG, a town of the French Netherlands, in the province of Hainault, ten miles weſt of Charlemont.

MARIENBURG is alſo a town of Polliſh Pruſſia, 20 miles ſouth-eaſt of Dantzic.

MARIGNAN, a city and port-town of Brazil, the capital of the captainſhip of Marignan, ſituated at the mouth of the river St. Mary: weſt longitude 44°, and ſouth latitude 2° 15′.

MARINER, the ſame with ſailor or ſeaman. See SAILORS and SEAMEN.

MARINO, a city of Italy, in the dutchy of Urbino, the capital of the territory of Marino, a little ſtate or commonwealth ſituated on a mountain in the middle of the pope's territories: eaſt long. 13° 3′, and north lat. 44°.

MARINO is alſo a town of Italy, in the Campania of Rome, eight miles eaſt of that city.

MARJORAM, *marjorana*, in botany, &c. See the article MARJORANA.

MARITIME, ſomething relating to, or bounded by the ſea: thus, a maritime province, or country, is one bounded by the ſea; and a maritime kingdom, or ſtate, is one that makes a conſiderable figure, or is very powerful at ſea. Hence by maritime powers, among the European

ſtates, are underſtood Great Britain and Holland. See the articles NAVAL AFFAIRS, NAVIGATION, &c.

MARK, in commerce, a certain note which a merchant puts upon his goods, or upon the caſk, hogſhead, &c. that contains them, in order to diſtinguiſh them from others, ſuth as a grape, a crow's foot, a diamond, a croſs, an aſteriſk, &c. Some uſe one or other of theſe marks by themſelves; others join them with the initial letters of their own name, and others uſe the letters only.

MARK *the evangeliſt's day*, a feſtival of the chriſtian church, obſerved April 25.

MARK's *Goſpel*, a canonical book of the New Teſtament, being one of the four Goſpels.

St. Mark wrote his Goſpel at Rome, where he accompanied St. Peter, in the year of Chriſt 44. Tertullian and others pretend, that St. Mark was no more than an amanuenſis to St. Peter, who dictated this Goſpel to him; others affirm, that he wrote it after St. Peter's death. Nor are the learned leſs divided as to the language this Goſpel was wrote in; ſome affirming it was compoſed in greek, others in latin. Several of the antient heretics received only the Goſpel of St. Mark: others among the catholics rejected the twelve laſt verſes of this Goſpel. The Goſpel of St. Mark is properly an abridgment of that of St. Matthew.

canons of St. MARK, a congregation of regular canons, founded at Mantua, by Albert Spinola a prieſt, towards the end of the XIIth century. Spinola made a rule for them, which was approved, corrected, and confirmed by ſeveral ſucceeding popes. About the year 1450, they were reformed, and followed only the rule of St. Auguſtine. This congregation having flouriſhed for the ſpace of four hundred years, declined by little and little, and is now become extinct.

knights of St. MARK, an order of knighthood in the republic of Venice, under the protection of St. Mark the evangeliſt. The arms of the order are, gules, a lion winged, or, with this device, PAX TIBI MARCE EVANGELISTA. This order is never conferred but on thoſe who have done ſignal ſervice to the commonwealth.

MARK, or MARC, alſo denotes a weight uſed in ſeveral ſtates of Europe, and for ſeveral commodities; eſpecially gold and ſilver. In France, the mark is divided into 8 ounces, or 64 drachms, or 192 deniers or penny-weights, or 160 eſterlines, or 300 mailles, or 640 felins, or 4608 grains. In Holland the mark-weight is alſo called troy-weight, and is equal to that of France. When gold and ſilver are ſold by the mark, it is divided into 24 caracts. See the article CARACT.

MARK is alſo uſed among us for a money of account, and in ſome other countries for a coin.

The engliſh mark is two thirds of a pound ſterling, or 13 s. 4 d. and the ſcotch mark is of equal value in ſcotch money of account. The mark-lubs, or lubeck-mark, uſed at Hamburgh, is alſo a money of account, equal to one third of the rix-dollar, or to the french livre: each mark is divided into ſixteen ſols-lubs. Mark-lubs is alſo a daniſh coin equal to 16 ſols-lubs. Mark is alſo a copper and ſilver coin in Sweden. See COIN.

MARKET, a public place in a city or town, in which live cattle, proviſions, or other goods, are ſet to ſale; and alſo a privilege, either by grant or preſcription, by which a town is enabled to keep a market.

A market is leſs than a fair, and is commonly held once or twice a week. According to Bracton, one market ought to be diſtant from all others at leaſt ſix miles and a half and a third of a half: but no market is to be kept within ſeven miles of the city of London; but all butchers, victuallers, &c. may hire ſtalls and ſtandings in the fleſh-markets there, and ſell meat and other proviſions, four days in a week. Every perſon who has a market, is entitled to receive toll for the things ſold in it; and, by antient cuſtom, for things ſtanding in the market, though nothing be ſold: but by keeping a market in any other manner than it is granted, or extorting of toll or fees, where none are due, they may be forfeited.

MARKET JEW, a market-town of Cornwal, ſituated on Mountſbay, ten miles eaſt of the Land's end.

MARLBRO, or MARLBOROUGH, a borough-town of Wiltſhire, eighteen miles north of Saliſbury.

It ſends two members to parliament.

MARLBRO-FORT, an engliſh factory on the weſt coaſt of the iſland of Sumatra, three miles eaſt of Bencoolen: eaſt long. 101°, and ſouth lat. 4° 15′.

MARLE, *marga*, in natural hiſtory, is an earth but ſlightly coherent, not ductile, ſtiff, or viſcid while moiſt, moſt eaſily

diffuſible in, and diſunited by water, and by it reduced into a ſoft, looſe, incoherent maſs.

Among the different kinds of marle, there is one that has a place in the catalogues of the materia medica, which is known in the german ſhops under the name of marga, or marla; this is ſometimes white, and at others fleſh-coloured: but the earth is the ſame under either of theſe appearances. It is of a compact, ſmooth, and ſomewhat gloſſy ſurface, and when ſmall pieces of it are rubbed between the fingers, it very eaſily moulders into a fine impalpable powder. This is eſteemed as an aſtringent, and is given as ſuch in diarrhœas, dyſenteries, and hæmorrhages; the red kind is preferred for the laſt intention; but the difference between this and the white is not worth regarding. The Germans alſo give it in fevers, in convulſions, and particularly in epileptic caſes, and in internal bruiſes: but we are apt to believe, that too many virtues are aſcribed to it.

Marle, uſed as a manure, is of very great ſervice to lands, eſpecially to ſuch as are ſandy and looſe: marls are of different qualities in the different counties of England, and are chiefly diſtinguiſhed by their colour; but the properties of any ſort of marle are better judged of, by its purity, and by its diſſolving in wet or froſt; for if it is fat and tender, and will open the land it is laid on, it may be taken for granted that it will be beneficial to it. Some adviſe burning the marle before it is laid on the land, by which means one load will go as far as five. The quantity of marle ought to be in proportion to the depth of the earth; and over-marling has often proved of worſe conſequence than under-marling, eſpecially where the land is ſtrong; but in ſandy land there can be no danger in laying on a great quantity, or repeating it often. Marles do not improve lands the firſt year ſo much as they do afterwards.

MARLI, a town of France, ten miles north-weſt of Paris, remarkable for a royal palace, and a very complex machine for raiſing water.

This machine, if Mr. Bernouilli's computation be right, muſt be a very bad one, ſince, according to him, no leſs than $\frac{55}{56}$ parts of its abſolute force is loſt.

MARLOW, a borough-town of Buckinghamſhire, fifteen miles ſouth of Ailesbury. It ſends two members to parliament.

MARMALADE, a confection of plumbs, apricots, quinces, &c. boiled with ſugar to a conſiſtence.

MARMOR, MARBLE. See MARBLE.

MARMORA, a little iſland of Turky, ſituated in the ſea of Marmora, to which it gives name, lying ſixty miles ſouth-weſt of Conſtantinople.

MARMOTTE, in zoology, the largeſt animal of the mus or rat-kind, with a long naked tail and tawney body: it is near as big as a hare, and breeds only on the tops of mountains in Switzerland. Its feet are ſomewhat like thoſe of a bear. See plate CLXX. fig. 2.

MARNE, a conſiderable river of France, which, riſing in the ſouth-eaſt of Champaign, falls into the river Seine, near Paris.

MARONITES, in church hiſtory, a ſect of chriſtians near mount Libanus in Syria, who are in communion with the church of Rome, and have their patriarch, archbiſhops, biſhops, &c.

MAROSCH, or MERISH, a great river, which, riſing in the Carpathian mountains, runs through Tranſilvania and Hungary, and falls into the river Teyſe at Segedin.

MARPURG, a city of Germany, forty miles north of Francfort: eaſt long. 8°, 40′, and north lat. 50° 40′.

MARQUE, or *Letters of* MARQUE, in military affairs, are letters of repriſal, granting the ſubjects of one prince or ſtate liberty to make repriſals on thoſe of another.

Letters of marque among us, are extraordinary commiſſions granted by authority, for reparation to merchants, taken and deſpoiled by ſtrangers at ſea; and repriſals is only the retaking, or taking one thing for another.

In the proſecution of theſe letters there muſt be, 1. The oath of the perſon injured, or other ſufficient proof, touching the injury ſuſtained. 2. A proof of due proſecution for ſatisfaction in a legal way. 3. The deferring or denial of juſtice. 4. A complaint to his own prince or ſtate. 5. A requiſition of juſtice made to the ſupreme head of the ſtate. After all which, letters of repriſal, under certain reſtrictions, are iſſued; but if the ſupreme power think theſe letters of repriſal may affect the peace of the ſtate, they are put off till a more convenient time.

For the diſtribution of ſuch prizes as are taken, in conſequence of theſe letters of marque, ſee the article PRIZE.

MARQUETRY, or INLAID-WORK, a cu-

a curious work compoſed of ſeveral fine hard pieces of wood, of various colours, faſtened in thin ſlices on a ground, and ſometimes enriched with other matters, as ſilver, braſs, tortoiſe-ſhell, and ivory; with theſe aſſiſtances the art is now capable of imitating any thing; whence it is by ſome called the art of painting in wood.

The ground on which the pieces are to be arranged and glued, is uſually of well-dried oak or deal, and is compoſed of ſeveral pieces glued together, to prevent its warping. The wood to be uſed in marquetry is reduced into leaves, of the thickneſs of a line, or the twelfth part of an inch, and is either of its natural colour, or ſtained, or made black to form the ſhades by other methods: this ſome perform by putting it in ſand heated very hot over the fire: others, by ſteeping it in lime water and ſublimate; and others, in oil of ſulphur. The wood being of the proper colours, the contours of the pieces are formed according to the parts of the deſign they are to repreſent: this is the moſt difficult part of marquetry, and that which requires the moſt patience and attention.

The two chief inſtruments uſed in this work, are a ſaw and a wooden vice, which has one of its chaps fixed, and the other moveable, which is open and ſhut by the foot, by means of a cord faſtened to a treddle. See plate CLXX. fig. 4.

The leaves to be formed, of which there are frequently three, four, or more joined together, are, after they have been glued on the outermoſt part of the deſign, whoſe profile they are to follow, put within the chaps of the vice; then the workman preſſing the treddle, and thus holding faſt the piece, with his ſaw runs over all the out-lines of his deſign. By thus joining or forming three or four pieces together, not only time is ſaved, but alſo the matter is the better enabled to ſuſtain the effort of the ſaw, which, how fine ſoever it may be, and how ſlightly ſoever it may be conducted by the workman, except this precaution were taken, would be apt to raiſe ſplinters, and ruin the beauty of the work. All the pieces having been thus formed by the ſaw, and marked, in order to their being known again, each is veneered, or faſtened in its place, on the common ground, with the beſt engliſh glue; and this being done, the whole is ſet in a preſs to dry, planed over, and poliſhed with the ſkin of the ſea-dog, wax, and ſhave-graſs, as in ſimple veneering, and the fine branches and more delicate parts of the figures are touched up and finiſhed with a graver.

MARQUIS, a title of honour, next in dignity to that of duke, firſt given to thoſe who commanded the marches, that is the borders and frontiers of countries. Marquiſſes were not known in England till king Richard II. in the year 1337, created his great favourite, Robert Vere, the earl of Oxford, marquis of Dublin; ſince which time there have been many creations of this ſort, though at preſent there is but one engliſh, three ſcotch and one iriſh marquiſſes. The manner of creating a marquis differs in nothing from that of a duke, except the difference of the titles, and the marquis's being conducted by a marquis and an earl, while a duke is led by a duke and a marquis: he is alſo girt with a ſword, has a gold verge put into his hand, and his robe or mantle is the ſame as thoſe of a duke, with only this difference, that a duke's mantle has four guards of ermine, and a marquis's only three and a half. The title given him, in the ſtyle of the heralds, is moſt noble and potent prince. His cap is the ſame as a duke's, and the difference between their coronets conſiſts in the duke's being adorned with only flowers or leaves, while the marquis's has flowers and pyramids with pearls on them, intermixed to ſhew that he is a degree between a duke and an earl.

MARR, that part of Aberdeenſhire ſituated between the rivers Dee and Don. See the article ABERDEEN.

MARRIAGE, a contract both civil and religious, between a man and a woman, by which they engage to live together in mutual love and friendſhip, for the ends of procreation, &c.

The firſt inhabitants of Greece lived together without marriage. Cecrops, king of Athens, was the firſt author of this honourable inſtitution among that people. After the commonwealths of Greece were ſettled, marriage was very much encouraged by their laws, and the abſtaining from it was diſcountenanced, and in many places puniſhed. The Lacedemonians were particularly remarkable for their ſeverity towards thoſe who deferred marrying, as well as to thoſe who wholly abſtained from it. The Athenians had an expreſs law, that all commanders, orators, and perſons entruſted with any public affairs, ſhould be married men. Polygamy,

gamy, or the having more than one wife at a time, was not commonly tolerated in Greece. See POLYGAMY.

The time of marriage was not the ſame in all places; the particular number of years to which they were limited, depended upon the humour of each lawgiver, nothing being generally agreed on in this matter. The ſeaſon of the year the moſt proper for marriage, was thought to be the winter, and eſpecially the month of January. See GAMELION, &c.

The Greeks thought it ſcandalous to contract marriage within certain degrees of conſanguinity; whilſt moſt of the barbarous nations allowed inceſtuous mixtures. Moſt of the grecian ſtates required that citizens ſhould match with none but citizens; and the children were not allowed to marry without the conſent of their parents: when there were orphan-virgins without any inheritance, the next of kin was obliged to marry them, or to ſettle a portion on them according to his quality.

The Romans, as well as the Greeks, diſallowed of polygamy. A Roman might not marry any woman who was not a Roman. It was thought diſhonourable for a woman to marry twice. Among the Romans the kalends, nones, and ides of each month were thought unlucky to be married in, as was alſo the feaſt of the parentalia, or feralia, and the whole month of May was reckoned the moſt unhappy ſeaſon.

We find but few laws in the books of Moſes concerning the inſtitution of marriage: he reſtrained the Iſraelites from marrying within certain degrees of conſanguinity; but we find that polygamy, though not expreſly allowed is however tacitly implied in the laws of Moſes: there is a particular law that obliged a man, whoſe brother died without iſſue, to marry his widow, and raiſe up children to his brother. The Hebrews purchaſed their wives, by paying down a competent dowry for them; and a man was at liberty to marry, not only in any of the twelve tribes, but even out of them, provided it was with ſuch nations as uſed circumciſion.

The antient chriſtian church laid ſeveral reſtraints upon her members in relation to marriage; ſuch was the rule forbidding chriſtians to marry with infidels and heathens: another reſtraint related to the conſanguinity and affinity prohibited in ſcripture; a third was, that children under age ſhould not marry without the conſent of their parents, guardians, or next relations: and another was, that there ſhould be ſome parity of condition between the contracting parties. They not only condemned polygamy, but even reckoned it unlawful to marry after a divorce. As to the ſeaſon in which marriage might or might not be celebrated in the chriſtian church, all we find is, that it was forbidden in lent. The romiſh church requires of the clergy perpetual abſtinence from marriage; and has advanced this inſtitution to the dignity of a ſacrament. The church of England, though ſhe does not conſider marriage as a ſacrament, yet looks upon it as an inſtitution ſo ſacred, as that it ought always to be celebrated by an eccleſiaſtical perſon; but marriages, without this ſanction, are not therefore null and void. There is no cannon of this church, which forbids marriages to be ſolemnized at any time. The canonical hours for celebrating of matrimony, are from eight to twelve in the forenoon. The impediments to marriage are ſpecified in Canon CII. of this church, and are theſe: 1. A preceding marriage, or contract; or any controverſy or ſuit depending on the ſame. 2. Conſanguinity or affinity. 3. Want of conſent of parents, or guardians. For the ſeveral ceremonies regarding marriages, ſee BRIDE, BRIDEGROOM, NUPTIAL RITES, HUSBAND, &c.

Marriage, according to our law, cannot be diſſolved but by death, breach of faith, or other notorious miſbehaviour. It is requiſite to complete a marriage, that there be a free and mutual conſent between the parties. The marriages performed by romiſh prieſts, whoſe orders are acknowledged by the church of England, are deemed good in ſome inſtances; but they ought to be ſolemnized agreeable to the rites of our own church, to be entitled to the benefits attending on marriage here, ſuch as dower, thirds, &c. A marriage in reputation, as among the quakers, is allowed to be ſufficient to give title to a perſonal eſtate; though in the caſe of a perſon married by a diſſenting miniſter, who was not in orders, it has been held that where a huſband demands a right due to him as ſuch by the eccleſiaſtical law, he ought to prove himſelf a huſband, thereby to be entitled to it; and yet this marriage is not altogether a nullity, becauſe by the laws of nature, the contract is binding. On a promiſe of mar-

marriage, if it be mutual on both ſides, damages may be recovered in caſe either party refuſes to marry: and though no time for the marriage is agreed on, if the plaintiff avers that he offered to marry the defendant, who refuſed it, an action is maintainable for the damages: but no action ſhall be brought upon any agreement, except it is in writing, and ſigned by the party to be charged.

For the better preventing clandeſtine marriages, and the inconveniencies ariſing therefrom, an act of parliament lately paſſed, wherein the following regulations were made, *viz.* That from and after March 25, 1754, banns of matrimony ſhall be publiſhed in the pariſh-church or ſome public chapel belonging to the pariſh wherein the parties dwell, upon three Sundays before the marriage, during the time of ſervice, immediately after the ſecond leſſon: and where the parties dwell in different pariſhes, the banns ſhall be publiſhed in both; and the marriage ſhall be ſolemnized in the church or chapel wherein the banns were publiſhed, and no where elſe; and it is alſo required, that both or either of the parties to be married, do reſide four weeks at leaſt in the pariſh where the banns are publiſhed. Nothing in this act deprives the archbiſhop of Canterbury of his uſual right of granting ſpecial licences to marry at any convenient time or place. All marriages ſolemnized contrary to the foreſaid regulations, ſhall be void; and the perſon ſolemnizing the ſame, ſhall be adjudged guilty of felony, and be tranſported for fourteen years to his majeſty's colonies. Marriages ſolemnized by licence, where either of the parties (not being a widow or widower) ſhall be under age, without the conſent of the father firſt had (if living) or of the guardians or one of them, and where there ſhall be no guardians, of the mother (if living and unmarried) or of the guardian appointed by chancery, ſhall be void to all intents and purpoſes. Where any ſuch guardian ſhall be non compos mentis, or in parts beyond the ſea, or ſhall refuſe their conſent to a proper match, the party may apply by petition to the lord chancellor, lord keeper, or lords commiſſioners of the great ſeal, who ſhall proceed on ſuch a petition in a ſummary way; and where the marriage propoſed ſhall appear to be proper, they ſhall judicially declare the ſame to be ſo by an order of court, which ſhall be deemed effectual. All marriages ſhall be ſolemnized in the preſence of two or more creditable witneſſes beſides the miniſter; and an entry thereof ſhall be immediately made in a regiſter kept for that purpoſe. This act ſhall not extend to the marriages of any of the royal family, nor to Scotland, nor to thoſe perſons called quakers, nor thoſe profeſſing the jewiſh religion.

Policy of encouraging MARRIAGE. Dr. Hally obſerves, that the growth and increaſe of mankind is not ſo much ſtinted by any thing in the nature of the ſpecies, as it is from the cautious difficulty moſt people make to adventure on the ſtate of marriage, from the proſpect of the trouble and charge of providing for a family: nor are the poorer ſort of people herein to be blamed, who beſides themſelves and families, are obliged to work for the proprietors of the lands that feed them; and of ſuch does the greater part of mankind conſiſt. Were it not for the backwardneſs to marriage, there might be four times as many births as we find; for by computation from the table, given under the article MORTALITY, there are 15000 perſons above ſixteen and under forty-five, of which, at leaſt, 7000 are women capable of bearing children; yet there are only 1238, or little more than a ſixth part of theſe, that breed yearly: whereas were they all married, it is highly probable that four of ſix ſhould bring forth a child every year, the political conſequences of which are evident. Therefore, as the ſtrength and glory of a kingdom or ſtate conſiſt in the multitude of ſubjects, celibacy above all things ought to be diſcouraged, as by extraordinary taxing or military ſervice: and, on the contrary, thoſe who have numerous families ſhould be allowed certain privileges and immunities, like the *jus trium liberorum* among the Romans; and eſpecially, by effectually providing for the ſubſiſtence of the poor.

MARROW, *medulla*, in anatomy, a ſoft oleaginous ſubſtance contained in the cavity of the bones.

The marrow of the bones, which anatomiſts of many ages took to be a mere ſhapeleſs and irregular maſs of matter, is found in reality to conſiſt of a number of fine ſubtile fat oleaginous ſubſtances, and of a number of minute veſicles of a membranaceous ſtructure, in which it is ſecreted from the arterial blood in the ſame manner as the fat of the reſt of the body. It is contained in a greater or leſſer

leſſer quantity in the cavities of moſt of the cylindrical bones: in the cavernous bones there is not properly any marrow, but a kind of red, fatty, medullary juice. The medullary veſſels, found running here and there through their appropriated canals, penetrate into the inner cavity of the bones, and ſecrete the medullary part from the blood there; the blood being afterwards returned again by the veins. The nerves are diſtributed to the ſame places for the ſake of ſenſe and motion. It has been a common opinion, that the marrow increaſed and decreaſed in quantity according to the increaſe and decreaſe of the moon; but this is by modern anatomiſts thought idle and erroneous; it does, indeed, increaſe and decreaſe in its ſeveral cavities, according to the exerciſe or reſt of the animal, or to its eating more or leſs, or better or worſe food. This ſubtile oleaginous ſubſtance penetrates in between the fibres of the bones, and preſerves them from dryneſs and from that brittleneſs which would be the conſequence of it; but it does not nouriſh them as was originally believed. See BONE.

MARRUBIUM, HOARHOUND and BASTARD-DITTANY, in botany, a genus of the didynamia-gymnoſpermia claſs of plants, with a monopetalous ringent flower, the upper lip of which is erect, ſemibifid, and acute, and the under lip reflex and ſemitrifid: the ſeeds are four, and contained in the cup.

Hoarhound is reputed attenuant and reſolvent, and accordingly preſcribed in moiſt aſthmas, and in all diſeaſes of the breaſt and lungs. There uſed to be a compound ſyrup of it kept in the ſhops, but it is now out of uſe.

MARS, in aſtronomy, one of the ſuperior planets, moving round the ſun in an orbit between thoſe of the earth and jupiter. See the article PLANET.

For the diameter of this planet, and its mean diſtance from the ſun, ſee the articles DIAMETER and DISTANCE.

The character of this planet is ♂, the excentricity of its orbit is 141, ſuppoſing the diſtance of the earth from the ſun 1000 equal parts; the inclination of its orbit to that of the earth is 1° 51′; the periodical time in which it performs its revolution round the ſun, is 686 days, 23 hours, 27′, 30″; its revolution round its own axis 24 hours, 40′; and its parallax, 30″. See the articles CHARACTER, EXCENTRICITY, &c.

In the achronical riſing of this planet, that is, when it is in oppoſition to the ſun, it is found twice as near the earth as the ſun, which is a phænomenon that has greatly diſcredited the ptolemaic hypotheſis. This planet, as well as the reſt, borrows its light from the ſun, and has its increaſe and decreaſe of light like the moon; and it may be ſeen almoſt biſſected when in its quadratures with the ſun, or in its perigæon; but is never corniculated or falcated, as the inferior planets.

Dr. Hook, in 1665, obſerved ſeveral ſpots in this planet, which having a motion, he concluded the planet to have a turbinated motion round its center. In 1666, M. Caſſini obſerved ſeveral ſpots in the two hemiſpheres of mars, which, by continuing his different obſervations very diligently, he found to move by little and little from eaſt to weſt, and to return in the ſpace of 24 hours 40′ to their former ſituation. Whence both the motion and period or natural day of that planet were determined. See the article MACULÆ.

Mars always appears with a ruddy troubled light, whence we conclude that it is encompaſſed with a thick cloudy atmoſphere, which by diſturbing the rays of light in their paſſage and re-paſſage through it, occaſion that appearance: beſides the ruddy colour of mars, we have another argument of his being encompaſſed with an atmoſphere, and it is this, that when any of the fixed ſtars are ſeen near his body, they appear extremely obſcured and almoſt extinct; and if this be the caſe, a ſpectator in mars would ſcarce ever ſee mercury, unleſs perhaps in the ſun at the time of conjunction, when mercury paſſes over his diſk, as he ſometimes appears to us, in form of a ſpot. An eye in mars will ſee venus at about the ſame diſtance from the ſun as mercury appears to us, and the earth about the ſame diſtance from the ſun that venus appears to us; and when the earth is found in conjunction with and very near the ſun, the eye in mars will ſee the earth horned or falcated, and its attendant, the moon, of the ſame figure, and at its utmoſt diſtance from the earth not above fifteen minutes of a degree: and as this planet's diſtance from the ſun is to the diſtance of the earth and ſun as $1\frac{1}{2}$ to 1, therefore a ſpectator in mars would ſee the ſun's diameter leſs by one third than it appears to us, and conſequently the

degree

degree of light and heat which mars receives from the ſun, is leſs by one third than that received by the earth; this proportion will, however, admit of a ſenſible variation, on account of the great excentricity of this planet.

Though the period or year of this planet, as has been already obſerved, is nearly twice as long as ours, and his natural day, or the time in which the ſun appears above the horizon (ſetting aſide the conſideration of twilight) is almoſt every where equal to his night; yet it appears that in one and the ſame place, on his ſurface, there will be but very little variety of ſeaſons, or ſcarce any difference of ſummer and winter: and the reaſon is, that the axis of his diurnal rotation is nearly at right angles with the plane of his orbit. It will be found, notwithſtanding, that places ſituated in different latitudes, that is, at different diſtances from his equator, will have very different degrees of heat, on account of the different inclination of the ſun's rays to the horizon, as it is with us when the ſun is in the equinoxes.

From this conſideration Dr. Gregory endeavours to account for the appearance of the faſciæ in mars, which are certain ſwaths or fillets ſeen in this planet, and poſited parallel to his equator: for as among us, the ſame climates has at different ſeaſons very unequal degrees of heat, but as in mars it is otherwiſe, the ſame parallel having always a pretty equable degree of heat, it follows, that theſe ſpots may probably be formed in mars, or in his atmoſphere, as ſnow and clouds are in ours, *viz.* by the conſtant different intentions of heat and cold in the different parallels, and ſo come to be extended in circles or belts parallel to his equator, or the circle of his diurnal motion. And this ſame principle may, perhaps, ſolve the phænomenon of jupiters belts, that planet, like mars, having a perpetual equinox. See JUPITER.

MARS, among chemiſts, denotes iron, as being ſuppoſed to be under the influence of that planet. See the article IRON.

Crocus of MARS. See the article CROCUS.

Cryſtals of MARS. See the article CRYSTALS *of Mars*.

Flowers of MARS. See the article FLOS.

Tree of MARS, *arbor martis*, in chemiſtry, a ſpecies of metallic vegetation, the proceſs of making which is this: diſſolve ſteel-filings in ſpirit of nitre, and to the ſolution add oil of tartar per deliquium; by this means a fermentation will be excited, which being over, there will be formed beautiful vegetations about the ſurface, expreſſing the branches of trees.

MARSALA, a port-town of Sicily, in the province of Mazara: eaſt long. 12° 6′, north lat. 37° 50′.

MARSALQUIVER, a port-town of Algiers, on the coaſt of Barbary, ſituated on a bay of the ſea, oppoſite to Oran.

MARSEILLES, a city and port of Provence, ſituated on a fine bay of the Mediterranean, twenty-five miles north-weſt of Toulon: eaſt long. 5° 20′, north lat. 43° 15′.

MARSHAL, in its primary ſignification, means an officer who has the command or care of horſes; but it is now applied to officers who have very different employments, as earl marſhal, knight marſhal, or marſhal of the king's houſe, *&c.* See the articles EARL-MARSHAL, KNIGHT-MARSHAL, *&c.*

MARSHAL *of the king's bench*, an officer who has the cuſtody of the king's bench-priſon in Southwark. This officer is obliged to give his attendance, and to take into his cuſtody all perſons committed by that court.

MARSHAL *of the exchequer*, an officer to whom that court commits the king's debtors.

MARSHAL *of the king's hall*, an officer who has the care of placing the houſhold-ſervants and ſtrangers at table, according to their quality.

MARSHAL, or MARESCHAL, of France, an officer of the greateſt dignity in the french armies. When two or more marſhals are in the army, the eldeſt commands.

MARSHALLING a coat, in heraldry, is the diſpoſal of ſeveral coats of arms belonging to diſtinct families, in one and the ſame eſcutcheon or ſhield, together with their ornaments, parts, and appurtenances.

MARSHFIELD, a market-town of Wiltſhire, thirty-miles north-weſt of Saliſbury.

MARSHLAND, the weſt diviſion of Norfolk. See the article NORFOLK.

MARSHMALLOW, *althæa*, in botany and medicine. See the article ALTHÆA.

MARSHY LANDS, thoſe liable to be overflowed by the ſea, or large rivers, for the draining of which, ſee the articles DITCH, DRAIN, *&c.*

As marſhy lands fatten cattle the ſooneſt of any, and preſerve ſheep from the rot, it would be a great improvement of them

to raiſe a croſs or ſemicircular bank of earth in them, and to plant this with trees, which might afford ſhelter to the cattle, a thing very much wanted in all of them.

MARSICO, a city of Italy, ſeventy miles ſouth-eaſt of Naples.

MARSILEA, in botany, a genus of the cryptogamia claſs of plants, without any corolla or cup: the antheræ are four, and placed on an obtuſely conic body: the fruit is of a roundiſh figure, conſiſting of four cells, in each of which are contained ſeveral roundiſh ſeeds.

Under this genus are comprehended the ſalvinia of Micheli, and pilularia of Dillenius.

MARSUPIALIS MUSCULUS, in anatomy, a muſcle otherwiſe called the internal obturator. See OBTURATOR.

MARTABAN, a city and port-town of the further India, on the eaſt ſide of the bay of Bengal: eaſt long 97°, north lat. 16° 10′.

MARTES, the martin, in zoology. See the article MARTIN.

St. MARTHA, a city and port-town of Terra Firma, in South America, and the capital of the province of St. Martha: weſt long. 74° 30′, north lat. 11° 45′.

MARTIAL, among phyſicians, an appellation given to the preparations of iron. See the article IRON.

MARTIAL LAW, is the law of war, which entirely depends on the arbitrary power of the prince, or of thoſe to whom he has delegated it. For though the king can make no laws in time of peace without the conſent of parliament, yet in time of war he uſes an abſolute power over the army.

MARTIGUES, a port-town of Provence, in France, ſituated on a bay of the Mediterranean, ſixteen miles weſt of Marſeilles.

MARTIN, *martes*, in zoology, a ſpecies of muſtela, of a blackiſh brown colour, and with a pale throat: it is about the ſize of the common cat, but more ſlender. See the article MUSTELA.

MARTIN is alſo the name of a bird of the hirundo-kind, of a black colour, and with the throat white. See HIRUNDO.

Cape MARTIN, a promontory of Valencia, in Spain, on the Mediterranean: it is under the meridian of London: north lat. 38° 50′.

MARTINGALE, in the manege, a thong of leather, faſtened to one end of the girths under the belly of a horſe, and at the other end to the muſs-roll, to keep him from rearing.

MARTINICO, the chief of the french Caribbee-iſlands, ſituated in 61° of weſt long. and between 14° and 15° north lat. It is ſixty miles long, but is ſcarce twenty broad in any part.

MARTLETS, in heraldry, little birds repreſented without feet, and uſed as a difference or mark of diſtinction for younger brothers, to put them in mind that they are to truſt to the wings of virtue and merit, in order to raiſe themſelves, and not to their feet, they having little land to ſet their foot on. See plate CLXV. fig. 4.

MARTNETS, in a ſhip, ſmall lines faſtened to the leetch of a ſail, reeved through a block on the top-maſt head, and coming down by the maſt to the deck. Their uſe is to bring the leetch of the ſail cloſe to the yard to be furled.

MARTYNIA, in botany, a genus of the didynamia-angioſpermia claſs of plants, with a monopetalous flower, campanulated, gibbous at the baſe, and containing a honey-juice: the fruit is an oblong capſule, containing four ſeeds of the ſame figure.

MARTYR, in the chriſtian ſenſe of the word, is one who lays down his life for the goſpel, or ſuffers death for the ſake of his religion.

The chriſtian church has abounded in martyrs, and hiſtory is filled with ſurprizing accounts of their ſingular conſtancy and fortitude under the cruelleſt torments human nature was capable of ſuffering. The primitive chriſtians were accuſed by their enemies of paying a ſort of divine worſhip to the martyrs. Of this we have an inſtance in the anſwer of the church of Smyrna to the ſuggeſtion of the Jews, who, at the martyrdom of Polycarp, deſired the heathen judge not to ſuffer the chriſtians to carry off his body, leſt they ſhould leave their crucified maſter, and worſhip him in his ſtead. To which they anſwered. "We can "neither forſake Chriſt, nor worſhip "any other: for we worſhip him as the "ſon of God; but love the martyrs as "the diſciples and followers of the Lord, "for the great affection they have ſhewn "to their king and maſter." A like anſwer was given at the martyrdom of Fructuoſus in Spain. For when the judge aſked Eulogius, his deacon, whether he would not worſhip Fructuoſus, as thinking

ing that though he refuſed to worſhip the heathen idols, he might yet be inclined to worſhip a chriſtian martyr; Eulogius replied, "I do not worſhip Fructuoſus, "but him whom Fructuoſus worſhips."

The primitive chriſtians believed, that the martyrs enjoyed very ſingular privileges: that upon their death they were immediately admitted to the beatific viſion, while other ſouls waited for the completion of their happineſs till the day of judgment: and that God would grant chiefly to their prayers the haſtening of his kingdom, and ſhortening the times of perſecution.

The churches built over the graves of the martyrs, and called by their names, in order to preſerve the memory of their ſufferings, were diſtinguiſhed by the title martyrium, confeſſio, or memoria.

The feſtivals of the martyrs are of very antient date in the chriſtian church, and may be carried back at leaſt till the time of Polycarp, who ſuffered martyrdom about the year of Chriſt 168. On theſe days the Chriſtians met at the graves of the martyrs, and offered prayers and thankſgivings to God for the examples they had afforded them: they celebrated the euchariſt, and gave alms to the poor; which, together with a panegyrical oration or ſermon, and reading the acts of the martyrs, were the ſpiritual exerciſes of theſe anniverſaries.

MARTYROLOGY, in the church of Rome, is a catalogue or liſt of martyrs, including the hiſtory of their lives and ſufferings for the ſake of religion.

The martyrologies draw their materials from the kalendars of particular churches, in which the ſeveral feſtivals dedicated to them are marked; and which ſeem to be derived from the practice of the antient Romans, who inſerted the names of heroes and great men in their faſti, or public regiſters.

The martyrologies are very numerous, and contain many ridiculous and even contradictory narratives; which is eaſily accounted for, if we conſider how many forged and ſpurious accounts of the lives of ſaints and martyrs appeared in the firſt ages of the church, which the legendary writers afterwards adopted without examining into the truth of them. However ſome good critics, of late years, have gone a great way towards clearing the lives of the ſaints and martyrs from the monſtrous heap of fiction they laboured under. See the article LEGEND.

MARVEL *of Peru*, in botany, a name uſed by ſome for jalap. See JALAP.

MARY MAGDALEN's DAY, a feſtival of the romiſh church, obſerved on the twenty-ſecond of July.

MARYGOLD, or MARSH-MARYGOLD, a plant called by botaniſts caltha. See the article CALTHA.

Corn MARYGOLD, chryſanthemum. See the article CHRYSANTHEMUM.

French MARYGOLD, in botany, tagetes. See the article TAGETES.

MARYLAND, one of the britiſh plantations in North America, ſituated between 74° and 78° weſt long. and between 38° and 40° north lat.

MASANDERAN, a province of Perſia, ſituated on the ſouthern coaſt of the Caſpian ſea, and uſually comprehended in Gilan.

MASCON, or MACON, a city of France, in the dutchy of Burgundy, thirty-five miles north of Lyons.

MASCULINE, or MASCULINE GENDER, among grammarians, that belonging to the male. See the article GENDER.

MASHAM, a market-town of Yorkſhire, ſituated twenty-four miles north-weſt of the city of York.

MASIERS, or MESIERS, a town of France, in the province of Champaign, ſituated on the river Maes, thirty-five miles north-eaſt of Rheims.

MASK, or MASQUE. See the article MASQUE.

MASON, a perſon employed under the direction of an architect, in the raiſing of a ſtone-building.

The chief buſineſs of a maſon is to make the mortar; raiſe the walls from the foundation to the top, with the neceſſary retreats and perpendiculars; to form the vaults, and employ the ſtones as delivered to him. When the ſtones are large, the buſineſs of hewing or cutting them belongs to the ſtone-cutters, though theſe are frequently confounded with maſons: the ornaments of ſculpture are performed by carvers in ſtones or ſculptors. The tools or implements principally uſed by them are the ſquare, level, plumb-line, bevel, compaſs, hammer, chiſſel, mallet, ſaw, trowel, *&c.* See SQUARE, *&c.*

Beſides the common inſtruments uſed in the hand, they have likewiſe machines for raiſing of great burdens, and the con-

ducting of large ſtones, the principal of which are the lever, pully, wheel, crane, *&c.* See the article LEVER, *&c.*

Free and accepted MASONS, a very antient ſociety or body of men, ſo called, either from ſome extraordinary knowledge of maſonry or building, which they are ſuppoſed to be maſters of, or becauſe the firſt founders of the ſociety were perſons of that profeſſion. Theſe are now very conſiderable, both for number and character, being found in every country in Europe, and conſiſting principally of perſons of merit and conſideration. As to antiquity, they lay claim to a ſtanding of ſome thouſand years. What the end of their inſtitution is, ſeems ſtill in ſome meaſure a ſecret; and they are ſaid to be admitted into the fraternity by being put in poſſeſſion of a great number of ſecrets, called the maſon's word, which have been religiouſly kept from age to age, being never divulged.

MASONRY, in general, a branch of architecture, conſiſting in the art of hewing or ſquaring ſtones, and cutting them level or perpendicular, for the uſes of building: but in a more limited ſenſe, maſonry is the art of aſſembling and joining ſtones together with mortar.

Hence ariſes as many different kinds of maſonry, as there are different forms and manners for laying or joining ſtones. Vitruvius mentions ſeven kinds of maſonry uſed among the antients, three of hewed ſtone, *viz.* that in form of a net, that in binding, and that called the greek maſonry; and three of unhewed ſtones, *viz.* that of an equal courſe, that of an unequal courſe, and that filled up in the middle; and the ſeventh was a compoſition of all the reſt, each in their order.

Net maſonry, called by Vitruvius reticulatum, from its reſemblance to the meſhes of a net, conſiſts of ſtones ſquared in their courſes, and ſo diſpoſed as that their joints go obliquely; and their diagonals are the one perpendicular, and the other level. This is the moſt agreeable maſonry to the eye, but is very apt to crack. See plate CLXX. fig. 6. n° 1.

Bound maſonry, that in which the ſtones were placed one over another like tiles; the joints of their beds being level, and the mounters perpendicular, ſo that the joint that mounts and ſeparates two ſtones, always falls directly over the middle of the ſtone below. This is leſs beautiful than the net work, but it is more ſolid and durable. See *ibid.* n° 2.

Greek maſonry, according to Vitruvius, is that where after we have laid two ſtones, each of which makes a courſe, another is laid at the end, which makes two courſes, and the ſame order is obſerved throughout the building; this may be called double binding, in regard the binding is not only of ſtones of the ſame courſe with one another, but likewiſe of one courſe with another courſe, *Ibid.* n° 3.

Maſonry by equal courſes, called by the antients iſodomum, differs in nothing from the bound maſonry but only in this, that its ſtones are not hewn. *Ibid.* n°. 4.

Maſonry by unequal courſes, called pſeudiſodomum, is alſo made of unhewed ſtones, and laid in bound work: but then they are not of the ſame thickneſs, nor is there any equality obſerved, excepting in the ſeveral courſes; the courſes themſelves being unequal to each other, *Ibid.* n° 5.

Maſonry filled up in the middle, called by the antients emplection, is likewiſe made of unhewed ſtones, and by courſes: but the ſtones are only ſet in order as to the courſes; the middle being filled up with ſtones thrown in at random among the mortar. *Ibid.* n° 6.

Compound maſonry is of Vitruvius's propoſing, ſo called as being formed of all the reſt. In this the courſes are of hewed ſtone; and the middle being left void, is filled up with mortar and pebbles thrown in together: after this the ſtones of one courſe are bound to thoſe of another courſe with cramp irons faſtened with melted lead. *Ibid.* n° 7.

All the kinds of maſonry now in uſe may be reduced to theſe five, *viz.* bound maſonry; that of brick-work, where the bodies and projectures of the ſtones incloſe ſquare ſpaces or pannels, *&c.* ſet with bricks; that de moilon, or ſmall work, where the courſes are equal, well ſquared, and their edges or beds ruſticated; that where the courſes are unequal; and that filled up in the middle with little ſtones and mortar.

MASQUE, or MASK, a cover for the face, with ſuitable apertures for the eyes and mouth.

MASQUES, in architecture, denotes certain groteſque faces, uſed to fill vacant places, as friezes, pannels of doors, keys of arches, *&c.*

MASQUERADE, an aſſembly of perſons maſked, and dreſſed in peculiar habits, meeting

BRITISH MUSEUM

Fig. 1. MADREPORA.

Fig. 2. MARMOTTE.

Fig. 3. MANTELETS.

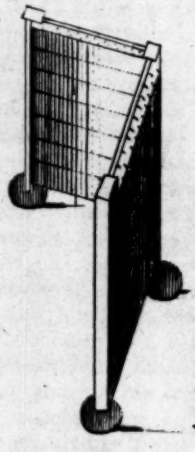


Fig. 4. MARQUETRY.

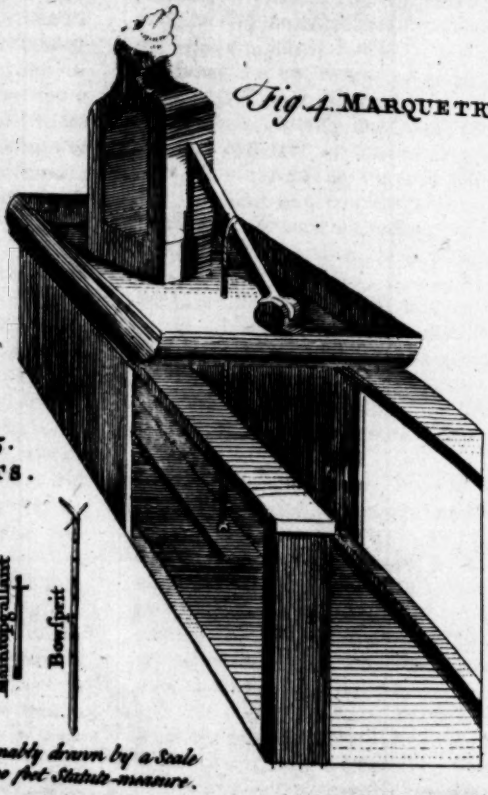
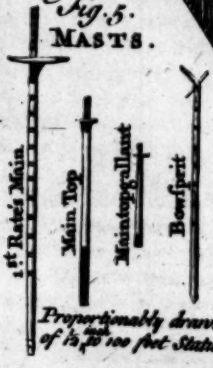


Fig. 5. MASTS.



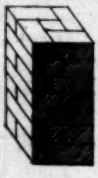
Proportionably drawn by a Scale of 1/8th inch to 100 feet Statute-measure.

Fig. 6. MASONRY.

Net-Masonry

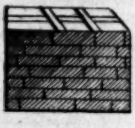
N.o 1.

Bound Masonry



N.o 2.

Greek Masonry



N.o 3.

Masonry by equal Courses

N.o 4.

Masonry by unequal Courses

N.o 5.

Masonry fill'd up in the Middle

N.o 6.

Compound Masonry

N.o 7.

Tyssery's sculp

meeting to dance and divert themſelves.

MASS, *miſſa*, in the church of Rome, the office or prayers uſed at the celebration of the euchariſt; or in other words, conſecrating the bread and wine into the body and blood of Chriſt, and offering them ſo tranſubſtantiated, as an expiatory ſacrifice for the quick and the dead. As the maſs is in general believed to be a repreſentation of the paſſion of our bleſſed Saviour, ſo every action of the prieſt, and every particular part of the ſervice, is ſuppoſed to allude to the particular circumſtances of his paſſion and death.

The general diviſion of maſſes conſiſts in high and low; the firſt is that ſung by the choriſters, and celebrated with the aſſiſtance of a deacon and ſub-deacon; low maſſes are thoſe in which the prayers are barely rehearſed without ſinging.

There are a great number of different or occaſional maſſes in the romiſh church, many of which have nothing peculiar but the name: ſuch are the maſſes of the ſaints; that of St. Mary of the ſnow, celebrated on the fifth of Auguſt; that of St. Margaret, patroneſs of lying-in women; that of the feaſt of St. John the baptiſt, at which are ſaid three maſſes; that of the Innocents, at which the gloria in excelſis, and the hallelujah are omitted, and it being a day of mourning, the altar is of a violet-colour. As to ordinary maſſes ſome are ſaid for the dead, and, it is ſuppoſed, contribute to fetch the ſoul out of purgatory; at theſe maſſes the altar is put in mourning, and the only decorations are a croſs in the midſt of ſix yellow wax-lights: the dreſs of the celebrant, and the very maſs-book are black: many parts of the office are omitted, and the people are diſmiſſed without the benediction. If the maſs be ſaid for a perſon diſtinguiſhed by his rank or virtues, it is followed with a funeral oration: they erect a chapelle ardente, that is, a repreſentation of the deceaſed, with branches and tapers of yellow wax, either in the middle of the church, or near the deceaſed's tomb, where the prieſt pronounces a ſolemn abſolution of the deceaſed. There are likewiſe private maſſes, ſaid for ſtolen or ſtrayed goods or cattle; for health; for travellers, &c. which go under the name of votive maſſes. There is ſtill a further diſtinction of maſſes denominated from the countries in which they were uſed; thus the gothic maſs, or miſſa moſarabum, is that uſed among the Goths when they were maſters of Spain, and which is ſtill kept up at Toledo and Salamanca; the ambroſian maſs is that compoſed by St. Ambroſe, and uſed only at Milan, of which city he was biſhop; the gallic maſs, uſed by the antient Gauls; and the roman maſs, uſed by almoſt all the churches in the romiſh communion.

MASS *of the præſanctified*, *miſſa præſanctificatorum*, is a maſs peculiar to the greek church, in which there is no conſecration of the elements; but after ſinging ſome hymns, they receive the bread and wine which was before conſecrated. This maſs is performed all Lent, except on Saturdays, Sundays, and the annunciation. The prieſt counts upon his fingers the days of the enſuing week on which it is to be celebrated, and cuts off as many pieces of bread at the altar, as he is to ſay maſſes; and after having conſecrated them, ſteeps them in wine, and then puts them in a box; out of which, upon every occaſion, he takes ſome of it with a ſpoon, and putting it on a diſh, ſets it upon the altar.

MASSA, a city of Italy, on the ſouth-ſide of the gulph of Naples, twenty miles ſouth of that capital.

MASSA, the capital of the dutchy of Maſſa Carara, in Italy, ſituated between the territories of Lucca and Genoa: eaſt long. 10° 40′, north lat. 43° 55′.

MASSA is alſo a town of Italy, in the dutchy of Tuſcany: eaſt long. 11° 50′, north lat. 43° 5′.

MASSACHUSET-COLONY, the principal ſub-diviſion of New-England, is bounded by New-Hampſhire, on the north; by the Atlantic ocean, on the eaſt and ſouth; and by Connecticut and New-York, on the weſt. It is about 100 miles long, and 40 broad.

MASSALIANS, a ſet of enthuſiaſts who ſprang up about the year 361, in the reign of the emperor Conſtantius, who maintained that men have two ſouls, a celeſtial and a diabolical, and that the latter is driven out by prayer. They pretended to prophecy, and affirmed that they could ſee the trinity with their corporeal eyes; and believed that the holy ghoſt deſcended viſibly upon them, eſpecially at the time of their ordination, when they trod the devil under foot, and danced upon him.

MASSETER, in anatomy, a muſcle which has its origin in the lower and interior part of the jugum, and its end at the external

ternal ſuperficies of the angle of the jaw. The ductus ſtenonianus, or ſalival duct of Steno, paſſes over this muſcle.

MASSIVE, among builders, an epithet given to whatever is too heavy and ſolid: thus a maſſive column, is one too ſhort and thick for the order whoſe capital it bears; and a maſſive wall, is one whoſe openings or lights are too ſmall in proportion.

MASSORA, in matters of literature, a critical work, containing remarks on the verſes, words, letters, and vowel-points of the hebrew-text of the bible; a work more laborious than uſeful, ſuch poor obſervations being beneath the notice of men of learning.

MASSOVIA, or WARSOVIA. See the article WARSOVIA.

MAST, in naval architecture, a large timber in a ſhip, for ſuſtaining the yards, ſails, *&c.* See the article SHIP.

In large veſſels there are four maſts, *viz.* the main maſt, fore-maſt, mizen-maſt, and bowſprit. The main-maſt is the principal one, ſtanding in the middle of the ſhip: its length, according to ſome, ſhould be $2\frac{1}{2}$ that of the midſhip-beam. Others give the following rule for finding its length, *viz.* multiply the breadth of the ſhip, in feet, by 24; from the product, cut off the laſt figure towards the right-hand; and the reſt will be the length required. Thus ſuppoſe the length of the midſhip beam was 30 feet; then $30 \times 24 = 720$, from which cutting off the laſt figure, there remains 72 feet for the length of the main-maſt. And as for the thickneſs of the main-maſt, it is uſual to allow an inch to every yard in length.

In plate CLXX. fig. 5. the reader will ſee a firſt rate's main-maſt, main-top, main-top-gallant, and bowſprit, drawn proportionally by a ſcale of $\frac{1}{12}$ of an inch to 100 feet ſtatute meaſure.

For the proportions, *&c* of the fore-maſt and mizen, ſee the articles FORE-MAST and MIZEN.

MASTER, *magiſter*, in general, is a title of authority; as the grand maſter of Malta, the maſter of St. Lazarus, *&c.*

The Romans had a great many officers thus denominated; as the maſter of the people, or dictator; the maſter of the cavalry, foot, cenſus, *&c.* See the articles DICTATOR, CAVALRY, *&c.*

MASTER *of arts*, is the firſt degree taken up in foreign univerſities, and for the moſt part in thoſe of Scotland; but the ſecond in Oxford and Cambridge; candidates not being admitted to it, till they have ſtudied ſeven years in the univerſity. See the article DEGREE.

MASTER *of the ceremonies*. See the article CEREMONY.

MASTERS *in chancery*, in ordinary, of which there are twelve, the maſter of the rolls being chief, are uſually choſen out of the barriſters of the common law, and ſit in chancery, or at the rolls, as aſſiſtants to the lord chancellor and maſter of the rolls.

To them are alſo committed interlocutory reports, ſtating of accounts, taking coſts, *&c.* And ſometimes by way of reference, they are impowered to make a final determination of cauſes.

They have, time out of mind, had the honour to ſit in the lords houſe, without either writ or patent to empower them.

They formerly inſpected all writs of ſummons, which is now performed by the clerk of the petty bag. Meſſages from the lords to the commons are carried by them. Affidavits are made before them, and deeds and recognizances acknowledged.

There are alſo maſters in chancery extraordinary, appointed by the lord chancellor in the ſeveral counties of England, for taking affidavits, recognizances, *&c.* for the eaſe of the ſuitors of the court.

MASTER *of the faculties*, an officer under the archbiſhop of Canterbury, who grants licences and diſpenſations.

MASTER-GUNNER. See GUNNER.

MASTER *of the horſe*, a great officer of the crown, who orders all matters relating to the king's ſtables races, breed of horſes; and commands the equerries and all the other officers and tradeſmen employed in the king's ſtables. His coaches, horſes, and attendants are the king's, and bear the king's arms and livery.

MASTER *of the ordnance*, a great officer, who has the chief command of the king's ordnance and artillery.

MASTER *of the revels*, an officer who orders all things relating to the performance of plays, maſks, balls, *&c.* at court.

MASTER *of the rolls*, a patent officer for life, who has the cuſtody of the rolls of parliament and patents which paſs the great-ſeal, and of the records of chancery, as alſo commiſſions, deeds, recognizances, which, being made of rolls of parchment, gave riſe to the name.

In abſence of the chancellor he ſits as judge in the court of chancery: at other times he hears cauſes in the rolls-chapel, and makes orders; but all hearings before him are appealable to the chancellor. He hath a writ of ſummons to parliament, and ſits on the ſecond woollpack next the lord chief juſtice.

In his gift are the ſix clerks in chancery, the examiners, three clerks of the petty bag, and the ſix clerks of the rolls-chapel, where the rolls are kept, and the rolls-houſe for his habitation, *&c.*

MASTER *of a ſhip*, the ſame with captain in a merchant-man; but in a king's ſhip he is an officer who inſpects the proviſions and ſtores, and acquaints the captain of what is not good, takes particular care of the rigging and of the ballaſt, and gives directions for ſtowing the hold; he navigates the ſhip under the directions of his ſuperior officer; ſees that the log and log-book be duly kept; obſerves the appearances of coaſts, and notes down in his journal any new ſhoal or rocks under water, with their bearing and depth of water, *&c.*

MASTER *at arms in a king's ſhip*, an officer who daily, by turns, as the captain appoints, is to exerciſe the petty officers and ſhip's company; to place and relieve ſentinels; to ſee the candles and fire put out according to the captain's orders; to take care the ſmall arms are kept in good order, and to obſerve the directions of the lieutenant at arms.

MASTER *of the Temple*, ſince the diſſolution of the order of the templars, the ſpiritual guide and paſtor of the Temple is ſo called, which was the denomination of the founder and his ſucceſſors.

MASTER *of the wardrobe*, an officer under the lord chamberlain, who has the care of the royal robes, as well as the wearing apparel, collar, george, and garter, *&c.* He has alſo the charge of all former kings and queens robes remaining in the Tower, all hangings, bedding, *&c.* for the king's houſe, the charge and delivery of velvet and ſcarlet allowed for liveries. He has under him a clerk of the robes, wardrobe keeper, a yeoman, *&c.*

MASTER-PIECE, *chef d' oeuvre*, is particularly uſed among the French, for a piece of work done by thoſe who deſire to be admitted maſter of any art or trade, by way of ſpecimen of their capacity.

MASTER-WORT, in botany. See the article IMPERATORIA.

Quarter-MASTER. See QUARTER.

MASTICATION, *maſticatio*, in medicine, the action of chewing, or of agitating the ſolid parts of our food between the teeth, by means of the motion of the jaws, the tongue, and the lips, whereby it is broken into ſmall pieces, impregnated with ſaliva, and ſo fitted for deglutition and a more eaſy digeſtion.

MASTICATORIES, in medicine, ſuch remedies as are taken in at the mouth, and chewed in order to promote the evacuation of the ſalival humour, as tobacco, ginger, pepper, ſage, roſemary, thyme, maſtich, *&c.*

MASTICH, in the materia medica, a ſolid reſin, of a pale, yellow, white colour, brought to us principally from the iſland of Chios, in drops or tears as it naturally forms itſelf in exſudating from the tree, about the bigneſs and much in the form of a pea. It is to be choſen clear, pellucid, and of a pale yellowiſh colour, well ſcented, and brittle. We meet with a kind of cæment ſometimes kept in the ſhops under the name of maſtich. It is compoſed of maſtich and ſeveral other ingredients, and is formed into cakes for uſe. This is intended for the ſervice of the lapidaries, to fill up cracks in ſtones, and for other ſuch purpoſes: but is by no means to be uſed as maſtich for any of the medicinal purpoſes.

Maſtich is detergent, aſtringent, and ſtomachic; it is greatly recommended in inveterate coughs and againſt ſpitting of blood. It ſtrengthens the ſtomach, aſſiſts digeſtion, and ſtops vomiting. It is uſed externally in plaſters to the regions of the ſtomach and inteſtines; and is ſaid to ſtop vomiting and purgings, by any means.

MASTIGADOUR, MASTICADOUR, or SLABBERING BIT, in the manege, a ſnaffle of iron, all ſmooth, and of a piece, guarded with paternoſters, and compoſed of three halfs of great rings, made into demi-ovals, of unequal bigneſs; the leſſer being incloſed within the greater, which ought to be about half a foot high. See the article BIT.

MASTOIDES, in anatomy, the ſame with mammillaris; being applied to ſuch proceſſes in the body as have the appearance of breaſts or dugs, ariſing in a broad baſis, and terminating in an obtuſe top. Maſtoides is ſometimes applied to the muſcle which ſtoops the head, proceeding from the neck-bone and breaſt-bone, and terminating in the proceſs of the mam-

mammiformis. See the articles MAMMILLARY and MUSCLE.

MASULIPATAN, a city and port-town of the hither India: east long. 81°, and north lat. 16° 18′.

MATAGORDA, a fortreſs at the entrance of the harbour of Cadiz.

MATAMAN, a country in the ſouth-weſt of Africa, bounded by Benguelo, on the north; by Manomotapa, on the eaſt; by Caffraria, on the ſouth; and by the Atlantic ocean, on the weſt.

MATAPAN-CAPE, in the Morea, the ſouth-moſt promontory of Europe, ſituated in eaſt long. 22°, north lat. 36°.

MATARO, a town of Spain, ſituated on the coaſt of Catalonia, twelve miles eaſt of Barcelona.

MATCH, a kind of rope ſlightly twiſted, and prepared to retain fire for the uſes of artillery, mines, fire-works, &c.

It is made of hempen tow, ſpun on the wheel like cord, but very ſlack; and is compoſed of three twiſts, which are afterwards again covered with tow, ſo that the twiſts do not appear: laſtly, it is boiled in the lees of old wines. This, when once lighted at the end, burns on gradually and regularly, without ever going out, till the whole be conſumed: the hardeſt and drieſt match is generally the beſt.

MATCHING, in the wine trade, the preparing veſſels to preſerve wines and other liquors, without their growing ſour or vapid. The method of doing it, as directed by Dr. Shaw, is as follows: melt brimſtone in an iron ladle, and when thoroughly melted, dip into it ſlips of courſe linen-cloth; take theſe out, and let them cool: this the wine-coopers call a match; take one of theſe matches, ſet one end of it on fire, and put it into the bung hole of a caſk; ſtop it looſely, and thus ſuffer the match to burn nearly out: then drive in the bung tight, and ſet the caſk aſide for an hour or two. At the end of this time examine the caſk, and you will find that the ſulphur has communicated a violent pungent and ſuffocating ſcent to the caſk, with a conſiderable degree of acidity, which is the gas and acid ſpirit of the ſulphur. The caſk may after this be filled with a ſmall wine, which has ſcarce done its fermentation, and bunging it down tight, it will be kept good, and will ſoon clarify: this is a common and very uſeful method, for many poor wines could ſcarce be kept potable even a few months without it.

MATER *Tenuis*, or *Pia* MATER. See the articles MENINGES and PIA MATER.

MATER DURA, or *dura* MATER. See alſo MENINGES and DURA MATER.

MATERA, a town of Italy, in the kingdom of Naples and territory of Otranto, ſituated thirty miles ſouth-weſt of Barri.

MATERAN, the capital of a kingdom of the ſame name, ſituated on the ſouth coaſt of the iſland of Java. This city is ſaid to lye in eaſt long. 110°, ſouth lat. 7° 45′.

MATERIA SUBTILIS, denotes a fine ſubtile matter which the Carteſians ſuppoſe to pervade and penetrate freely the pores of all bodies, to fill up all their pores ſo as not to leave the leaſt vacuity or interſtice between them; they had recourſe to this machine to ſupport the doctrine of an abſolute plenum, and to make it conſiſtent with the phænomenon of motion, &c. See CARTESIAN PHILOSOPHY, PLENUM and VACUUM.

MATERIA CHEMICA, a term uſed by authors to expreſs ſuch bodies as are the peculiar objects of chemical experiments. See LABORATORY and CHEMISTRY.

MATERIA MEDICA, comprehends all the ſubſtances either uſed in medicine in their natural ſtate, or which afford preparations that are ſo; theſe belong partly to the animal, partly to the vegetable, and partly to the foſſil kingdom. See the articles ANIMAL, VEGETABLE and FOSSIL.

The preparations and virtues of all which are delivered under their reſpective articles, but in as conciſe and ſcrupulous a manner as we poſſibly could; ſince we cannot but remark, with the great Boyle, that it is too frequent in writers on the materia medica, to give us rather encomiums than impartial accounts of the ſimples they treat of. However, the ſame great author prefers the uſe of approved ſimples to that of compound medicines, becauſe one or other of the ingredients may have different operations from thoſe intended by the phyſician; and he adds, that he had ſo many unwelcome proofs of this himſelf, that he thought it his duty to caution others againſt the like inconvenience.

MATHEMATICS, from μαθησις, originally ſignified any diſcipline or learning; but, at preſent, denotes that ſcience which teaches, or contemplates

whatever is capable of being numbered or measured, in so far as computable or measurable; and, accordingly, is subdivided into arithmetic, which has numbers for its object, and geometry, which treats of magnitude. See the articles ARITHMETIC and GEOMETRY.

Mathematics are commonly distinguished into pure and speculative, which consider quantity abstractedly; and mixed, which treat of magnitude as subsisting in material bodies, and consequently are interwoven every where with physical considerations.

Mixed mathematics are very comprehensive; since to them may be referred astronomy, optics, geography, hydrography, hydrostatics, mechanics, fortification, navigation, &c. See the articles ASTRONOMY, OPTICS, &c.

Pure mathematics have one peculiar advantage, that they occasion no disputes among wrangling disputants, as in other branches of knowledge; and the reason is, because the definitions of the terms are premised, and every body that reads a proposition has the same idea of every part of it. Hence it is easy to put an end to all mathematical controversies, by shewing, either that our adversary has not stuck to his definitions, or has not laid down true premises, or else that he has drawn false conclusions from true principles; and in case we are able to do neither of these, we must acknowledge the truth of what he has proved.

It is true, that in mixed mathematics, where we reason mathematically upon physical subjects, we cannot give such just definitions as the geometricians: we must therefore rest content with descriptions; and they will be of the same use as definitions, provided we are consistent with ourselves, and always mean the same thing by those terms we have once explained.

Dr. Barrow gives a most elegant description of the excellence and usefulness of mathematical knowledge, in his inaugural oration, upon being appointed professor of mathematics at Cambridge.

The mathematics, he observes, effectually exercise, not vainly delude, nor vexatiously torment studious minds with obscure subtilties; but plainly demonstrate every thing within their reach, draw certain conclusions, instruct by profitable rules, and unfold pleasant questions. These disciplines likewise enure, and corroborate the mind to a constant diligence in study; they wholly deliver us from a credulous simplicity, most strongly fortify us against the vanity of scepticism, effectually restrain us from a rash presumption, most easily incline us to a due assent, perfectly subject us to the government of right reason. While the mind is abstracted and elevated from sensible matter, distinctly views pure forms, conceives the beauty of ideas, and investigates the harmony of proportions; the manners themselves are sensibly corrected and improved, the affections composed and rectified, the fancy calmed and settled, and the understanding raised and excited to more divine contemplations.

MATRASS, CUCURBIT, or BOLTHEAD, amongst chemists. See CUCURBIT.

MATRICARIA, FEVERFEW, in botany, a genus of the syngenesia polygamia superflua class of plants, the compound flower of which is radiated, the hermaphrodite flowers are tubulose and numerous, placed on an hemispherical disc: the female ones are ligulated and placed in the radius: the seeds are oblong, naked and solitary, being contained in the cup, and placed on a convex, naked receptacle. See plate CLXXI. fig. 1.

This plant has always been allowed one of the first places among the hysteric and uterine plants. It has been prescribed in powder from a scruple to half a dram for a dose, but the much better way is in slight infusion made in the manner of tea. Taken in the same manner for a continuance of time, it will bring the menses, though subject to be interrupted and irregular, to their true period, and will remove a number of complaints, the natural consequences of such an irregularity. It is an agreeable carminative and bitter; it strengthens the stomach and disperses flatulencies; and the expressed juice is said to kill worms in the bowels. Hoffman praises it as a febrifuge.

MATRICE, or MATRIX. See the article MATRIX.

MATRICULA, a register kept of the admission of officers and persons entered into any body or society, whereof a list is made.

This word was formerly applied to a kind of alms-house where the poor were provided for, having certain revenues appropriated to it for that purpose.

MATRIX, in anatomy, the ſame with uterus. See the article UTERUS.

MATRIX, in letter-foundery. See the article FOUNDERY.

MATRONALIA, a feſtival of the antient roman matrons, from whom it had its name. It was celebrated on the kalends of March in honour of the god Mars: and was to the roman ladies what the feſtival of the ſaturnalia was to their huſbands; for at this time they ſerved their women ſlaves at tables, and received preſents from their huſbands. See the article SATURNALIA.

There are two reaſons given for its inſtitution: its being kept in remembrance of the peace concluded between the Romans and Sabines by the mediation of the women; or of Ilia, the mother of Romulus, being with child by Mars.

MATROSSES, are ſoldiers in the train of artillery, who are next to the gunners, and aſſiſt them in loading, firing and ſpunging the great guns. They carry fire-locks, and march along with the ſtore-waggons, both as a guard, and to give their aſſiſtance in caſe a waggon ſhould break down.

MATT, in a ſhip, rope-yard, junk, *&c.* beat flat and interwoven; uſed in order to preſerve the yards from galling or rubbing in hoiſting or lowering them.

MATTADORE, in playing at ombre. See the article OMBRE.

MATTAGESS, in ornithology, a name by which the greater butcher-bird is ſometimes called.

MATTER, *materia*, in phyſiology, whatever is extended and capable of making reſiſtance: hence, becauſe all bodies, whether ſolid or fluid, are extended, and do reſiſt, we conclude that they are material, or made up of matter. The Carteſians, it is true, make matter to conſiſt in extenſion alone; but extenſion, without reſiſtance, is nothing but mere ſpace. That matter is one and the ſame thing in all bodies, and that all the variety we obſerve ariſes from the various forms and ſhapes it puts on, ſeems very probable, and may be concluded from a general obſervation of the procedure of nature in the generation and deſtruction of bodies. Thus, for inſtance, water, rarified by heat, becomes vapour; great collections of vapours form clouds; theſe condenſed deſcend in the form of hail or rain; part of this collected on the earth conſtitutes rivers; another part mixing with the earth enters into the roots of plants, and ſupplies matter to, and expands itſelf into various ſpecies of vegetables. In each vegetable it appears in one ſhape in the root, another in the ſtalk, another in the flowers, another in the ſeeds, *&c.* From hence various bodies proceed; from the oak, houſes, ſhips, *&c.* from hemp and flax we have thread; from thence our various kinds of linen; from thence garments; theſe degenerate into rags, which receive from the mill the various forms of paper; hence our books; which by fire are converted partly into water, partly into oil, another part into air, a fourth part into ſalt, and a fifth into earth; which are called the elements of bodies; and which, mixed with common earth, are again reſuſcitated in various forms of bodies.

According to Sir Iſaac Newton, it ſeems highly probable, that God in the beginning formed matter into ſolid, maſſy, impenetrable, moveable particles, of atoms, of ſuch ſizes and figures, and with ſuch other properties, and in ſuch proportion to ſpace, as moſt conduced to the end for which he formed them; and that theſe primitive particles being ſolids, are incomparably harder than any porous bodies compounded of them, even ſo hard as never to wear or break in pieces; no ordinary power being able to divide what God himſelf made one in the firſt creation. While theſe particles continue entire, they may compoſe bodies of one and the ſame nature and texture in all ages: but ſhould they wear away, or break in pieces, the nature of things depending on them may be changed. Water and earth, compoſed of old worn particles and fragments of particles, would not be of the ſame nature and texture now, with water and earth compoſed of intire particles in the beginning; and therefore, that nature may be laſting, the changes of corporeal things are to be placed only in the various ſeparations and new aſſociations of motion of theſe permanent particles, compound bodies being apt to break, not in the midſt of ſolid particles, but where theſe particles are laid together, and only touch in a few points. See the article ATOM.

The elements, or principles of matter

to which all bodies are ultimately reducible, have been already mentioned under the article ELEMENT.

And the existence, laws and properties of matter have been treated of under the articles ESSENCE, EXISTENCE, INERTIA, EXTENSION, DIVISIBILITY, GRAVITATION, EXPERIMENTAL PHILOSOPHY, &c.

MATTER *in deed*, in law, signifies a particular matter of fact to be proved by some deed, and is frequently mentioned with matter of record; as where a man, during his absence abroad in the king's service, is sued to an exigent; in which case, if such person would take advantage of this matter in deed, he must alledge it before a scire facias for execution is awarded against him, otherwise he can have no relief but from matter of record; that is, some error in the proceedings appearing upon the face of the record.

A difference is likewise made between matter in deed, matter of record, and nude matter; which last is a naked allegation of a thing done, proved by witnesses only, and neither by record nor deed.

MATTHEW, or *Gospel of St.* MATTHEW, a canonical book of the New Testament.

St. Matthew wrote his gospel in Judea, at the request of those he had converted, and it is thought he began it in the year 41, eight years after Christ's resurrection. It was written, according to the testimony of all the antients, in the hebrew or syriac language, which was then common in Judea; but the greek version of it, which now passes for the original, is as old as the apostolical times. St. Matthew's view in writing his gospel, was chiefly to shew the royal descent of Jesus Christ, and to represent his life and conversation among men. No one of the apostles enters so far into the particulars of the actions of Jesus Christ, or has given so many rules for the conduct of life. If we compare him with the other three evangelists, we may observe a remarkable difference in the order and succession of our Saviour's actions, from chap. iv. to chap. xiv. 13. Some have imputed this variation of St. Matthew to mere chance; and others to choice and design: however, it can be no prejudice to the truth of the facts, which are the essential part of the gospel; and as to the order of time, the sacred authors were not always solicitous about it.

St. MATTHEW *the Evangelist's day*, a festival of the christian church, observed on September 21.

St. MATTHEW, in geography, a small island on the coast of Guinea, planted by the Portugueze, but deserted: west long. 9°, south lat. 2° 30′.

St. MATTHIAS's *day*, a festival of the christian church, observed on the 24th of February.

MATTHIOLA, in botany, a genus of plants not reduced to any class; its flower is said to be tubular, with an undivided limb; its stamina five subulated filaments, and its fruit a globose drupe, coronated with the cup, and containing a nut and kernel of the same shape with itself.

MATTINS, the first canonical hour, or the first part of the daily service in the romish church.

MATTURANTS, *maturantia*, in pharmacy, medicines which promote the suppuration of tumours. See the article SUPPURATIVES.

MATURATION, in surgery, the same with suppuration. See the article SUPPURATION.

MAUBEUGE, a town of the Austrian Netherlands, in the province of Hainault, eleven miles south of Mons.

MAULEON, a town of Gascony in France, seventeen miles south-east of Bayonne.

MAUNCH, in heraldry, the figure of an ancient coat sleeve, borne in many gentlemen's escutcheons.

MAUNDY-THURSDAY, is the Thursday in Passion-week, which was called Maunday or Mandate-thursday, from the command which our Saviour gave his apostles to commemorate him in the Lord's supper, which he this day instituted; or from the new commandment which he gave them to love one another, after he had washed their feet as a token of his love to them.

Our Saviour's humility in washing his disciples feet, is commemorated on this day by most christian kings; who wash the feet of a certain number of poor people, not indeed with their own royal hands, but by the hands of their lord almoner, or some other deputy.

St. MAURA, an island of the Mediterranean, situated between the province of Epirus and the island of Cephalonia;

ſubject to Venice: east long. 21°, north lat. 38° 50′.

MAURICE, or MORITIUS, an iſland in the indian ocean, ſubject to the Dutch: east long. 56°, ſouth lat. 20°.

MAURIENNE St. JOHN, the capital of the territory of Maurienne, in Savoy, east long. 6° 10′, north lat. 45° 18′.

MAURITANIA, the antient name of the coaſt of Barbary, from the city of Tangier to that of Algiers; the weſt part of it, in which Tangier ſtands, was called Mauritania Tingitana; and that farther eaſt, Mauritania Cæſarienſis.

MAUSOLEUM, a magnificent tomb, or funeral monument. The word is derived from Mauſolus, king of Caria, to whom Artemiſia, his widow, erected a moſt ſtately monument, eſteemed one of the wonders of the world, and called it, from his name, mauſoleum.

St. MAWES, a port and borough town of Cornwall: ſituated twenty miles north of the Lizard. It ſends two members to parliament.

MAXILLA, the jaws, or thoſe parts of an animal in which the teeth are ſet.

The jaws are ſhorter in the human frame than in that of any other animal, in proportion to the ſize of the body; and this is a circumſtance that adds greatly to the beauty of the face. The upper jaw is compoſed of thirteen bones, twelve of which are in pairs: theſe are, 1. the lachrymal; 2. the naſal; 3. the jugal; 4. the maxillar; 5. the ſpongioſum inferius; 6. the palatine: the thirteenth is an odd bone, and is called the vomer. Theſe ſeveral bones of the upper maxilla are united to one another by a kind of juncture, which appears equal and even, and is called by anatomiſts juncturа per harmoniam.

The maxilla inferior, or lower jaw, is that moveable bone of the head which contains the lower ſeries of teeth; this is compoſed of two bones which unite in the middle of the chin, by the intervention of a cartilage, which hardens as the child grows, and at length becoming bony, joins the two bones into a continued one, reſembling the greek υ. It conſiſts of two tables, between which there is a ſpongy ſubſtance, which in children is medullary. The fore part is ſhallow, and juſt ſufficient to contain the ſockets of ſixteen teeth. It has two proceſſes, the coronoide and condyloides; four foramina or holes for the paſſage of blood-veſſels and nerves, and ſix pair of muſcles, of which two are depreſſors, and four elevators; the depreſſors are called the platyſma myoides, and the biventer; and the four pair of elevators are, the crotaphites, the maſſeters, and the internal and external pterygoidæi, which ſee under their ſeveral names. There is alſo the maxillary gland, ſituated on the inſide under the lower jaw-bone. See the article GLAND.

MAXIM, an eſtabliſhed propoſition or principle, in which ſenſe it denotes much the ſame with axiom. See the article AXIOM.

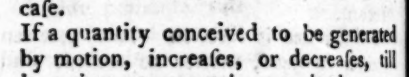
Maxims are a kind of propoſitions, which have paſſed for principles of ſcience, and which, being ſelf-evident, have been by ſome ſuppoſed innate.

MAXIMUM, in mathematics, denotes the greateſt quantity attainable in any given caſe.

If a quantity conceived to be generated by motion, increaſes, or decreaſes, till it arrives at a certain magnitude or poſition, and then, on the contrary, grows leſſer or greater, and it be required to determine the ſaid magnitude or poſition, the queſtion is called a problem de maximis et minimis.

Thus, let a point *m* move uniformly in a right line, from A towards B, and let another point *n* move after it, with a velocity either increaſing, or decreaſing, but ſo that it may, at a certain poſition, D, become equal to that of the former point *m*, moving uniformly.

This being premiſed, let the motion of *n* be firſt conſidered as an increaſing one; in which caſe the diſtance of *n*



behind *m* will continually increaſe, till the two points arrive at the cotemporary poſitions C and D; but afterwards it will again decreaſe; for the motion of *n*, till then, being ſlower than at D, it is alſo ſlower than that of the preceding point *m* (by the hypotheſis;) but becoming quicker afterwards, than that of *m*, the diſtance *m n* (as has been already ſaid) will again decreaſe: and therefore is a maximum, or the greateſt of all, when the celerites of the two points are equal to each other.

But

But if n arrives at D with a decreasing celerity; then its motion being first swifter, and afterwards slower, than that of m, the distance mn will first decrease and then increase; and therefore is a minimum, or the least of all, in the forementioned circumstance. Since then the distance mn is a maximum, or a minimum, when the velocities of m and n are equal, or when that distance increases as fast through the motion of m, as it decreases by that of n, its fluxion at that instant is evidently equal to nothing. Therefore, as the motion of the points m and n may be conceived such that their distance mn may express the measure of any variable quantity whatever, it follows, that the fluxion of any variable quantity whatever, when a maximum or a minimum, is equal to nothing.

The rule therefore to determine any flowing quantity in an equation proposed, to an extreme value, is, having put the equation into fluxions, let the fluxion of that quantity (whose extreme value is sought) be supposed equal to nothing; by which means all those members of the equation in which it is found, will vanish, and the remaining ones will give the determination of the maximum or minimum required.

Prob. I. To divide a given right line into two such parts, that their product, or rectangle, may be the greatest possible. This is the case, when the line is bissected, or divided into equal parts, as has been shewn under the article FLUXION.

In any mechanical engine the proportion of the power to the weight, when they ballance each other, is found by supposing the engine to move, and reducing their velocities to the respective directions in which they act; for the inverse ratio of those velocities is that of the power to the weight according to the general principle of mechanics. But it is of use to determine likewise the proportion they ought to bear to each other, that when the power prevails, and the engine is in motion, it may produce the greatest effect in a given time. When the power prevails, the weight moves at first with an accelerated motion; and when the velocity of the power is invariable, its action upon the weight decreases, while the velocity of the weight increases. Thus the action of a stream of water or air upon a wheel, is to be estimated from the excess of the velocity of the fluid above the velocity of the part of the engine which it strikes, or from their relative velocity only. The motion of the engine ceases to be accelerated when this relative velocity is so far diminished, that the action of the power becomes equal to the resistance of the engine arising from the gravity of the matter that is elevated by it, and from friction; for when these ballance each other, the engine proceeds with the uniform motion it has acquired.

Prob. II. Let a denote the velocity of the stream, u the velocity of the part of the engine which it strikes when the motion of the machine is uniform, and $a-u$ will represent their relative velocity. Let A represent the weight which would ballance the force of the stream when its velocity is a, and p the weight which would ballance the force of the same stream if its velocity was only $a-u$; Then $p : A :: \overline{a-u}^2 : a^2$, or $p = A \times \frac{\overline{a-u}^2}{aa}$, and p shall represent the action of the stream upon the wheel. If we abstract from friction, and have regard to the quantity of the weight only, let it be equal to q A (or be to A as q to 1) and because the motion of the machine is supposed uniform, $p = q \times A = \frac{A \times \overline{a-u}^2}{aa}$, or $q = \frac{\overline{a-u}^2}{aa}$. The momentum of this weight is $q\,A\,u = \frac{Au \times \overline{a-u}^2}{aa}$; which is a maximum when the fluxion of $\frac{u \times \overline{a-u}^2}{aa}$ vanishes, that is, when $u \times \overline{a-u}^2 - 2uu \times a - u = 0$, or $a - 3u = 0$. Therefore, in this case, the machine will have the greatest effect if $u = \frac{a}{3}$, or the weight $q\,A = \frac{A \times \overline{a-u}^2}{aa} = \frac{4A}{9}$. That is, if the weight that is raised by the engine be less than the weight which would ballance the power in the proportion of 4 to 9; and the momentum of the weight is $\frac{4Aa}{27}$.

Prob. III. Suppose that the given weight

P (plate CLXXI. fig. 3. n° 1.) descending by its gravity in the vertical line, raises a given weight W by the cord PMW (that passes over the pulley M) along the inclined plane BD, the height of which BA is given; and let the position of the plane BD be required, along which W will be raised in the least time from the horizontal line AD to B.

Let $AB=a$, $BD=x$, $t=$ time in which W describes DB; then the force which accelerates the motion of W is $P-\frac{aW}{x}$, tt is as $\frac{xx}{Px-aW}$, and if we suppose the fluxion of this quantity to vanish, we shall find $x=\frac{2aW}{P}$ or $P=\frac{2aW}{x}$; consequently the plane BD required is that upon which a weight equal to 2 W would be sustained by P; or if BC be the plane upon which W would sustain P, then $BD=2BC$. But if the position of the plane BD be given, and W being supposed variable, it be required to find the ratio of W to P, when the greatest momentum is produced in W along the given plane BD; in this case, W ought to be to P as BD to $BA+\sqrt{BD+BA}+\sqrt{BA}$.

Questions of this kind may be likewise demonstrated from the common elementary geometry of which the following may serve as an example.

Prob. IV. Let a fluid, moving with the velocity and direction AC (*ibid.* n° 2.) strike the plane CE, and suppose that this plane moves parallel to itself in the direction CB, perpendicular to CA, or that it cannot move in any other direction; then let it be required to find the most advantageous position of the plane CE, that it may receive the greatest impulse from the action of the fluid. Let AP be perpendicular to CE in P, draw AK parallel to CB, and let PK be perpendicular upon it in K; and AK will measure the force with which any particle of the fluid impels the plane EC, in the direction CB. For the force of any such particle being represented by AC, let this force be resolved into AQ parallel to EC, and AP perpendicular to it; and it is manifest, that the latter AP only has any effect upon the plane CE. Let this force AP be resolved into the force AL perpendicular to CB, and the force AK parallel to it; then it is manifest, that the former, AL, has no effect in promoting the motion of the plane in the direction CB; so that the latter, AK, only, measures the effort by which the particle promotes the motion of the plane CE, in the direction CB. Let EM and EN be perpendicular to CA and CB, in M and N; and the number of particles, moving with directions parallel to AC, incident upon the plane CE, will be as EM. Therefore the effort of the fluid upon CE, being as the force of each particle, and the number of particles together, it will be as $AK\times EM$; or, because AK is to AP (=EM) as EN to CE, as $\frac{EM^2\,EM\times EN}{CE}$; so that CE being given, the problem is reduced to this, to find when $EM^2\times EN$ is the greatest possible, or a maximum. But because the sum of EM^2 and of EN^2 (=CM^2) is given, being always equal to CE^2, it follows that $EN^2\times EM^4$ is greatest when $EN^2=\frac{1}{3}CE^2$; for when the sum of two quantities AC and CB (*ibid.* n° 3.) was given, $AC\times CB^2$ is greatest when $AC=\frac{1}{3}AB$, as will be very evident if a semicircle is described upon AD. But when $EN^2\times EM^4$ is greatest, its square root $EN\times EM^2$ is of necessity at the same time greatest. Therefore the action of the fluid upon the plane CE in the direction CB is greatest when $EN^2=\frac{1}{3}CE^2$, and consequently $EM^2=\frac{2}{3}CE^2$; That is, when EM the sine of the angle ACE in which the stream strikes the plane is to the radius, as $\sqrt{2}$ to $\sqrt{3}$; in which case it easily appears from the trigonometrical tables, that this angle is of 54° 44′.

Several useful problems in mechanics may be resolved by what we have just now shewn. If we represent the velocity of the wind by AC, (n° 2.) a section of the sail of a windmill perpendicular to its length by CE, as it follows from the nature of the engine, that its axis ought to be turned directly to the wind, and the sail can only move in a direction perpendicular to the axis, it appears, that when the motion begins, the wind will have the greatest effect to produce the motion, when the angle ACE in which the wind strikes the sail is of 54° 44′. In the same manner, if CB repre-

the direction of the motion of a ſhip, or the poſition of her keel, abſtracting from her lee-way, and A C be the direction of the wind, perpendicular to her way, then the moſt advantageous poſition of the ſail C E, to promote her motion in the direction C B, is when the angle A C E, in which the wind ſtrikes the ſail, is of 54° 44′. The beſt poſition of the rudder, where it may have the greateſt effect in turning round the ſhip, is determined in like manner.

MAY, *maius*, the fifth month of the year, conſiſting of thirty-one days. See the article MONTH and YEAR.

In this month the ſun enters the ſign gemini. See the article GEMINI.

MAY is alſo the name of a little iſland, in the mouth of the frith of Forth, near the coaſt of Fife in Scotland.

MAYENNE, a city of France, in the province of Orleanois: weſt long. 45′, and north lat. 48° 20′.

MAYHEM, or MAIM, in law. See the article MAIM.

MAYL, among falconers, ſignifies to pinion a hawk's wings.

MAYO, one of the Cape Verde iſlands: weſt long. 23°, north lat. 15°.

MAYO is alſo a county of Ireland, in the province of Connaught, having Slego on the north, and Roſcommon on the ſouth.

MAYOR, the chief magiſtrate of a city or town, choſen annually out of the aldermen.

If any perſon intrudes into the office of mayor, a quo warranto lies againſt him, upon which he ſhall not only be ouſted, but fined. And no mayor, or perſon holding an annual office in a corporation for one year, is to be elected into the ſame office for the next; in this caſe, perſons obſtructing the choice of a ſucceſſor, are ſubject to 100 l. penalty. Where the mayor of a corporation is not choſen on the day appointed by charter, the next officer in place ſhall the day after hold a court and elect one; and if there be a default or omiſſion that way, the electors may be compelled to chooſe a mayor, by virtue of a writ of mandamus out of the king's bench. Mayors, or other magiſtrates of a corporation, who ſhall voluntarily abſent themſelves on the day of election, are liable to be impriſoned and diſqualified from holding any office in the corporation.

MAZAGAN, a port-town of Morocco: weſt long. 10°, north lat. 33°.

MAZARA, the capital of the province of the ſame name in Sicily, ſituated on the ſouth-weſt coaſt: eaſt long. 12° 30′, north lat. 37° 42′.

MAZORAH, or MASSORA. See the article MASSORA.

MEACO, a city of the iſland of Niphon, or Japan: eaſt long. 135°, north lat. 35° 20′.

MEAD, an agreeable liquor made of honey and water. See HONEY.

There are many receipts for making mead, of which the following is one of the beſt. Take four gallons of water, and as much honey as will make it bear an egg; add to this, the rind of three lemons; boil it, and ſcum it well as it riſes. Then take it off the fire, and add the three lemons cut in pieces; pour it into a clean tub or open veſſel, and let it work for three days: then ſcum it well, and pour off the clear part into a caſk, and let it ſtand open till it ceaſes to make a hiſſing noiſe; then ſtop it up cloſe, and in three months time it will be fine and fit for bottling.

If you would give it a finer flavour, take cloves, mace, and nutmeg, of each four drams; beat them ſmall, tie the powder in a piece of cloth, and put it into the caſk.

MEADIA, a town of Hungary, in the Bannat of Tameſwaer, fifteen miles eaſt of Belgrade.

MEADOW, in its general ſignification, means paſture, or graſs-land, annually mown for hay; but it is more particularly applied to lands that are ſo low as to be too moiſt for cattle to graze upon them in winter, without ſpoiling the ſward. Too much, or too little water is almoſt equally prejudicial to meadows, but the beſt land for meadows is a rich ſoil, that has a moiſt bottom, eſpecially where a ſmall brook may be brought over it, and where there is ſuch a deſcent that the water will not lodge: theſe are better than thoſe by great rivers, where the crops are often loſt. Thoſe that may be over-flowed at pleaſure, are called water-meadows; theſe ſhould never be over-flowed till the end of March, except once or twice in winter, when there are ſuch floods as bring down a great deal of ſoil from the upper lands, and if the ſeaſon ſhould prove dry,

dry, it will be of great ſervice to the graſs, if the meadows are overflowed again; but then the cattle ſhould not be turned in till the ſward is dry enough to bear their weight. Miller recommends the weeding of meadows in April and October, with a ſpaddle, and rolling them with a heavy roller in ſpring and autumn. See the article PASTURE.

MEAN, in general, denotes the middle between two extremes: thus we ſay, mean diſtance, mean proportion, &c. See the articles DISTANCE, PROPORTION, &c.

MEAN ANOMALY, in aſtronomy. See the article ANOMALY.

MEAN { CONJUNCTION, / OPPOSITION, } in aſtronomy, is when the mean place of the ſun is in { conjunction, / oppoſition, } with the mean place of the moon in the ecliptic. See the articles CONJUNCTION and OPPOSITION.

MEAN *diſtance of a planet from the ſun*, in aſtronomy, is the right line drawn from the ſun, to the extremity of the conjugate axis of the ellipſis the planet moves in; and this is equal to the ſemitranſverſe axis, and is ſo called, becauſe it is a mean between the planet's greateſt and leaſt diſtance from the ſun. See the article DISTANCE.

MEAN MOTION, in aſtronomy, that whereby a planet is ſuppoſed to move equally in its orbit, and is always proportional to the time. See the article MOTION.

MEASLES, in medicine, a cutaneous diſeaſe, attended with a fever, in which there is an appearance of eruptions that do not tend to a ſuppuration. The meaſles begin with chilneſs and ſhivering, and heat and cold ſucceed by turns. The next day the fever comes on, with great ſickneſs, thirſt, and loſs of appetite; the tongue is white, but not dry; there is a little cough, a heavineſs of the head and eyes, and a continual ſleepineſs; then follows a ſneezing, and ſwelling of the eye-lids, and a ſerous humour oft diſtils from the noſe and eyes, which are certain ſigns that the eruption is at hand. In the face, the ſpots are ſmall, but on the breaſt broad and red. The patient vomits, but oftner has a looſeneſs with greeniſh ſtools. Theſe ſymptoms continue and increaſe till the fourth, and ſometimes the fifth day, at which time the ſpots, which are like flea-bites, increaſe in number and magnitude, but riſe little above the ſkin. The ſymptoms do not immediately vaniſh after the eruption, as in the ſmall-pox, except the vomiting. The cough and fever increaſe, with difficulty of breathing. About the ſixth day, the ſkin of the face and forehead begins to grow rough, and the cuticle breaking, the puſtules die away; and on the eighth day the ſpots diſappear in the face, and are ſcarce viſible any where elſe; on the ninth, they quite vaniſh, and fine, thin, light ſcales, fall from the ſkin.

The meaſles are in general not dangerous, unleſs from an inſalubrious epidemical conſtitution of the year, which ſometimes renders them malignant; which may be known by a ſudden loſs of ſtrength, coldneſs of the extreme parts, great reſtleſſneſs, and a delirium. Thoſe who die of the meaſles, are generally ſuffocated on the ninth day. Some have a looſeneſs, which continues ſeveral weeks, and brings on a mortal tabes. Some have a ſlow fever, with an atrophy and a ſwelling of the abdomen, which are fatal; and when a cough and hoarſeneſs remain after the diſeaſe, a conſumption will follow without ſpeedy aſſiſtance.

If children are ſuſpected to abound with crudities in the inteſtines, it will be proper to evacuate with half a grain of tartar emetic, and ſyrup of ſuccory with rhubarb. When there are worms, anthelmintics ſhould be given. In adults abounding with blood, phlebotomy is neceſſary on the firſt days; and as ſoon as the eruption is ended a gentle cathartic is proper: in a cough, nothing is better than oil of almonds freſh drawn, mixed with ſyrup of capillaire; half a ſpoonful of which ſhould be often given in water gruel. The patient ſhould keep his bed for two days after the firſt eruption, and take abſorbent and diaphoretic powders to which half a grain of ſaffron may be added; theſe ſhould be taken every night from the firſt onſet of the diſeaſe till the patient recover, encreaſing or diminiſhing the doſe according to his age. If after the meaſles diſappear, they ſhould be followed by a difficulty of breathing, a fever, and other ſymptoms of an inflammation of the lungs, let blood be taken freely from the arm, once, twice or three times, as occaſion ſhall require.

leaving a due ſpace between each bleeding, and give oil of ſweet almonds, and about twelve days from the invaſion let the patient be purged. The diet ought to be the ſame as in the ſmall-pox, taking particular care that the body be kept lax rather than bound up, through the courſe of the diſtemper. See POX.

MEASURE, *menſura*, in geometry, denotes any quantity aſſumed as one, or unity, to which the ratio of other homogeneous or ſimilar quantities is expreſſed. This definition is ſomewhat more agreeable to practice than that of Euclid, who defines meaſure, a quantity which being repeated any number of times becomes equal to another. This latter definition anſwers only to the idea of an arithmetical meaſure, or quota-part.

MEASURE *of an angle*, is an arch deſcribed from the vertex in any place between its legs.

Hence angles are diſtinguiſhed by the ratio of the arches, deſcribed from the vertex between the legs to the peripheries. Angles then are diſtinguiſhed by thoſe arches; and the arches are diſtinguiſhed by their ratio to the periphery: thus an angle is ſaid to be ſo many degrees as there are in the ſaid arch. See the article ANGLE.

MEASURE *of a figure*, or plane ſurface, is a ſquare whoſe ſide is one inch, foot, yard, or ſome other determinate length. Among geometricians, it is uſually a rod called a ſquare rod, divided into ten ſquare feet, and the ſquare feet into ten ſquare digits. Hence ſquare meaſures. See the articles TRIANGLE, SQUARE, PARALLELOGRAM, SURVEYING, *&c.*

MEASURE *of a line*, any right line taken at pleaſure, and conſidered as unity. The modern geometricians uſe a decempeda, or perch, divided into ten equal parts, called feet; the feet they ſubdivide into ten digits, and the digit into ten lines, *&c.*

MEASURE *of the maſs, or quantity of matter*, in mechanics, is its weight; it being apparent that all the matter which coheres and moves with a body, gravitates with it, and it being found by experiment, that the gravities of homogeneal bodies are in proportion to their bulks; hence, while the maſs continues the ſame, the weight will be the ſame, whatever figure it put on: by which is meant its abſolute weight, for as to its ſpecific, that varies as the quantity of the ſurface varies. See the articles GRAVITY and MOMENT.

MEASURE *of a number*, in arithmetic, ſuch a number as divides another without leaving any fraction: thus 9 is a meaſure of 27.

MEASURE *of a ſolid*, is a cube whoſe ſide is one inch, foot, yard, or any other determinate length. In geometry, it is a cubic perch, divided into cubic feet, digits, *&c.* hence cubic meaſures, or meaſures of capacity. See the articles SPHERE, CUBE, *&c.*

MEASURE *of velocity*, in mechanics, the ſpace paſſed over by a moving body in a given time. To meaſure a velocity therefore, the ſpace muſt be divided into as many equal parts as the time is conceived to be divided into; the quantity of ſpace anſwering to ſuch an article of time is the meaſure of the velocity. See the article VELOCITY.

MEASURE, in a legal and commercial ſenſe, denotes a certain quantity or proportion of any thing bought, ſold, valued, or the like. Meaſures are then various, according to the various kinds and dimenſions of the things meaſured. Hence ariſe lineal or longitudinal meaſures, for lines or lengths; ſquare meaſures, for areas or ſuperficies; and ſolid or cubic meaſures, for bodies and their capacities. All which again are very different in different countries, and in different ages, and even many of them for different commodities. Whence ariſe other diviſions of antient and modern meaſures, domeſtic and foreign ones, dry meaſures, liquid meaſures, *&c.*

Long MEASURES, or MEASURES *of application*. The engliſh ſtandard long meaſure for commerce, or that whereby the quantities of things are ordinarily eſtimated in the way of trade, is the yard, containing three engliſh feet. Its diviſions are the foot, ſpan, palm, inch, and barley-corn; its multiples the pace, fathom, pole, furlong, and mile. The proportions theſe ſeverally bear to each other, are expreſſed in the following table.

Engliſh MEASURES of Length.

Barley-corns	Inch	Palm	Span	Foot	Cubit	Yard	Pace	Fathom	Pole	Furlong	Mile.
1											
9	1										
27	9	3									
36	12	4	1⅓								
54	18	6	2	1½							
108	36	12	4	3	2						
180	60	20	6⅔	5	3⅓	1⅔					
216	72	24	8	6	4	2	1⅕				
594	198	66	22	16½	11	5½	3 3/10	2⅕			
23760	7920	2640	880	660	440	220	132	110	40		
190080	63360	21120	7040	5280	3520	1760	1056	880	320	8	

Scripture-MEASURES of Length reduced to Engliſh.

	Eng. feet.	inch. Dec.
Digit	0	0.912
4 Palm	0	3.648
12 (3 Span)	0	10.944
24 (6, 2 Cubit)	1	9.888
96 (24, 8, 4 Fathom)	7	3.552
144 (36, 12, 6, 1½ Ezechiel's reed)	10	11.328
192 (48, 16, 8, 2, 1⅓ Arabian pole)	14	7.104
1920 (480, 160, 80, 20, 13⅓, 10 Schœnus, or meaſuring line.)	145	11.04

The Longer Scripture-MEASURES.

	Engliſh miles	paces	feet.
Cubit	0	0	1.824
400 Stadium	0	145	4.6
2000 (5 Sab. day's journey)	0	729	3.000
4000 (10, 2 Eaſtern mile)	1	403	1.000
12000 (30, 6, 3 Paraſang)	4	153	3.000
96000 (240, 48, 24, 8 a day's journey)	33	172	4.000

Grecian MEASURES of Length reduced to Engliſh.

Dactylus, digit	Doron, dochme	Lichas	Orthodoron	Spithame	Foot	Cubit	Pygon	Cubit larger	Pace	Furlong.	Mile	Engliſh Paces.	feet.	dec.
1												0	0	0.7554 11/16
4	1											0	0	3.0218 3/4
10	2 1/2	1										0	0	7.5546 7/8
11	2 3/8	1 1/5	1 1/11									0	0	8.3101 9/10
12	3	1 1/3	1 5/11	1 1/2								0	0	9.0656 1/4
16	4	1 2/3	1 7/11	1 1/2	1 1/8							0	1	0.0875
18	4 1/2	1 4/5	1 9/11	1 2/3	1 1/4	1						0	1	1.5984 3/8
20	5	2	2 2/11	2	1 1/2	1 1/5	1					0	1	3.109 3/8
24	6	2 2/5	2 8/11	2	1 1/2	1 1/5	1	1				0	1	6.13125
96	24	9 3/5	8 8/11	8	6	5 1/3	4 4/5	4	1			0	6	0.525
9600	2400	960	872 8/11	800	600	533 1/3	480	400	100	1		100	4	4.5
76800	19200	7680	6981 9/11	6400	4800	4266 2/3	3840	3200	800	8	1	805	5	0

Roman MEASURES of length reduced to Engliſh

Digitus tranſverſus	Uncia	Palmus minor	Pes	Palmipes	Cubitus	Gradus	Paſſus	Stadium	Milliare	Engliſh. Paces.	feet	dec.
1	1/3									0	0	0.725 1/4
4	3	1								0	0	2.901
16	12	4	1							0	0	11.604
20	15	5	1 1/4	1						0	1	2.505
24	18	6	1 1/2	1 1/5	1					0	1	5.406
40	30	10	2 1/2	2	1 2/3	1				0	2	5.01
80	60	20	5	4	3 1/3	2	1			0	4	10.02
10000	7500	2500	625	500	416 2/3	250	125	1		120	4	4.5
80000	60000	20000	5000	4000	3333 1/3	2000	1000	8	1	967	0	0

A Table of the MEASURES of Length of the principal Places in Europe, compared with the Engliſh Yard.

		Eng. yard.
100	Aunes or ells of England equal to	125
100	of Holland or Amſterdam	75
100	of Brabant or Antwerp	76
100	of France —	128¼
100	of Hamburgh, Francfort, &c.	62½
100	of Breſlau —	60
100	of Dantzick —	66⅔
100	of Bergen and Dronthiem	68¼
100	of Sweden or Stockholm	65¼
100	of St. Gall, for linens	87½
100	of ditto, cloths —	67
100	of Geneva —	124¾
100	Canes of Marſeilles and Montpelier —	214½
100	of Toulouſe and high Languedoc	200
100	of Genoa, of 9 palms	245¼
100	of Rome —	227¼
100	Varas of Spain — —	93¾
100	of Portugal —	123
100	Cavidos of Portugal —	75
102	Braſſes of Venice —	73½
100	of Bergamo, &c.	71¼
100	of Florence and Leghorn	64
100	of Milan —	58½

N. B. The aunes or ells of Amſterdam, Haerlem, Leyden, the Hague, Rotterdam, and other cities of Holland, as alſo that of Nuremberg being all equal, are comprehended under that of Amſterdam; as thoſe of Oſnabrug are under thoſe of France; and thoſe of Bern and Baſil are equal to thoſe of Hamburg, Francfort, and Leipſic.

For the ſubdiviſions and multiples of each of theſe meaſures of length. See the article AUNE, &c.

For the proportion of the feet of the principal nations of Europe, compared with the engliſh foot, ſee the article FOOT.

Square, or *Superficial* MEASURES. Engliſh ſquare or ſuperficial meaſures, are raiſed from the yard of 36 inches multiplied into itſelf, and thus producing 1296 ſquare inches in the ſquare yard: the diviſions of this are ſquare feet and inches; and the multiples, poles, roods, and acres, as in the following table.

Engliſh Square-MEASURES.

Inches					
144	Feet				
1296	9	Yards			
3600	25	2⅞	Paces		
29304	272¼	30¼	10.89	Poles	
5631616	10890	1210	435.6	40	Rood
6272640	43560	4840	1742.6	160	4 acre

Grecian ſquare-meaſures were the plethron, or acre, by ſome ſaid to contain 1444, by others 10000 ſquare feet; and aroura, the half of the plethron. The aroura of the Egyptians was the ſquare 100 cubits.

Roman Square-MEASURE reduced to Engliſh.

The integer was the jugerum or acre, which the Romans divided like the libra or as: thus, the jugerum contained

	ſquare feet.	ſcruples.	Engl. roods.	Engl. perches.	Square feet.
As	28800	288	2	18	250.05
Deunx	26400	264	2	10	183.85
Dextans	24000	240	2	2	117.64
Dodrans	21600	216	1	34	51.42
Bes	19200	192	1	25	257.46
Septunx	16800	168	1	17	191.25
Semis	14400	144	1	9	125.03
Quincunx	12000	120	1	1	58.81
Triens	9600	96	0	32	264.85
Quadrans	7200	72	0	24	198.64
Sextans	4800	48	0	16	132.43
Uncia	2400	24	0	8	66.21

Note, Actus major was 14400 ſquare feet, equal to a ſemis; clima, 3600 ſquare feet, equal to ſeſcuncia; and actus minimus equal to a ſextans.

Cubical MEASURES, or *Meaſures of capacity for liquids*.

The engliſh meaſures were originally raiſed from troy-weight; it being enacted by ſeveral ſtatutes that eight pounds troy of wheat, gathered from the middle of the ear, and well dried, ſhould weigh a gallon of wine meaſure, the diviſions and multiples whereof were to form the other meaſures; at the ſame time it was alſo ordered, that there ſhould be but one liquid meaſure in the kingdom: yet cuſtom has prevailed, and there having been intro-

introduced a new weight, *viz.* the avoirdupois, we have now a second ſtandard-gallon adjuſted thereto, and therefore exceeding the former in the proportion of the avoirdupois weight to troy weight. From this latter ſtandard are raiſed two ſeveral meaſures, the one for ale, the other for beer.

The ſealed gallon at Guildhall, which is the ſtandard for wines, ſpirits, oils, *&c.* is ſuppoſed to contain 231 cubic inches; and on this ſuppoſition the other meaſures raiſed therefrom, will contain as in the table underneath: yet by actual experiment, made in 1688, before the lord-mayor and the commiſſioners of exciſe, this gallon was found to contain only 224 cubic inches: it was however agreed to continue the common ſuppoſed contents of 231 cubic inches; ſo that all computations ſtand on their old footing. Hence as 12 is to 231, ſo is $14\frac{12}{20}$ to $281\frac{1}{4}$ the cubic inches in the ale-gallon: but in effect the ale-quart contains $70\frac{1}{2}$ cubic inches, on which principle the ale and beer-gallon will be 282 cubic inches. The ſeveral diviſions and multiples of theſe meaſures, and their proportions, are exhibited in the following tables.

Engliſh MEASURE of Capacity for Liquids.

Wine-Meaſure.

Solid inches							
$28\frac{7}{8}$	Pint						
231	8	Gallon					
4158	144	18	Rundlet				
7276½	252	31½	1¾	Barrel			
9702	336	42	2⅓	1⅓	Tierce		
14553	504	63	3½	2	1½	Hogſhead	
19279	672	84	4⅔	2⅔	2	1⅓	Punchion
29106	1008	126	7	4	3	2	1½ Butt
58212	2016	252	14	8	6	4	3 2 Tun.

Ale-Meaſure.

Pints					
8	Gallon				
64	8	Firkin			
128	16	2	Kilderkin		
256	32	4	2	Barrel	
512	64	8	4	2	Hogſhead.

Beer-Meaſure.

Pints					
8	Gallon				
72	9	Firkin			
144	18	2	Kilderkin		
288	36	4	2	Barrel	
576	72	8	4	2	Hogſhead

Jewiſh MEASURES of Capacity for Liquids, reduced to Engliſh Wine-meaſure.

							Gall.	Pints	Solid inches.
¼	Log	—	—	—	—	—	0	0⅛	0.177
5/6	4	Cab	—	—	—	—	0	0⅝	0.211
1⅓	1⅓	3	Hin	—	—	—	0	3⅓	0.844
3	24	6	2	Seah	—	—	1	2	2.533
6	72	18	6	3	Bath, or Epha	—	2	4	5.067
60	720	180	60	30	10	Coron, or Chomer	7	4	15.2
							75	5	7.625

Attic

Attic MEASURES of Capacity for Liquids, reduced to Engliſh Wine-meaſure.

									Gall.	Pints.	cub. inch Dec.
Cochliarion									0	$\frac{1}{120}$	0.035$\frac{63}{128}$
2	Cheme								0	$\frac{1}{60}$	0.071$\frac{1}{8}$
3	$1\frac{1}{2}$	Myſtron							0	$\frac{1}{48}$	0.089$\frac{11}{128}$
5	$2\frac{1}{2}$	2	Conche						0	$\frac{1}{24}$	0.178$\frac{11}{64}$
10	5	4	2	Cyathos					0	$\frac{1}{12}$	0.356$\frac{11}{32}$
15	$7\frac{1}{2}$	6	3	$1\frac{1}{2}$	Oxybaphon				0	$\frac{1}{8}$	0.535$\frac{1}{4}$
60	30	24	12	6	4	Cotyle			0	$\frac{1}{2}$	2.141$\frac{1}{4}$
120	60	48	24	12	8	2	Xeſtes		0	1	4.283
720	360	288	144	72	48	12	6	Chous	0	6	25.698
8640	4320	3456	1728	864	576	144	72	12 Metretes	10	2	19.629

Roman MEASURES of Capacity for liquids, reduced to Engliſh Wine-meaſure.

									Gall.	Pints.	cub. inch Dec.
Ligula									0	$0\frac{1}{48}$	0.11$\frac{7}{16}$
4	Cyathus								0	$0\frac{1}{12}$	0.469
6	$1\frac{1}{2}$	Acetabulum							0	$0\frac{1}{8}$	0.704
12	3	2	Quartarius						0	$0\frac{1}{4}$	1.409
24	6	4	2	Hemina					0	$0\frac{1}{2}$	2.818
48	12	8	4	2	Sextarius				0	1	5.636
288	72	48	24	12	6	Congius			0	7	4.942
1152	288	192	96	48	24	4	Urna		3	$4\frac{1}{2}$	5.33
2304	576	384	192	96	48	8	2	Amphora	7	1	10.66
46080	11520	7680	3840	1920	960	160	40	20 Culeus	143	3	11.095

In the modern liquid-meaſures of foreign nations, it is to be obſerved, that their ſeveral veſſels for wine, vinegar, &c. have alſo various denominations, according to their different ſizes, and the places wherein they are uſed. The woeders of Germany, for holding rheniſh and moſelle-wines, are different in their gauges; ſome containing 14 aumes of amſterdam-meaſure, and others more or leſs. The aume is reckoned at Amſterdam for 8 ſteckans, or 20 verges, or for $\frac{1}{6}$ of a ton of 2 pipes; or 4 barrels of France or Bourdeaux, which $\frac{1}{6}$ at this latter place is called tiercon, becauſe 3 of them make a pipe or 2 barrels, and 6 the ſaid ton. The ſteckan is 16 mingles, or 32 pints; and the verge is, in reſpect of the ſaid theniſh and moſelle, and ſome other ſorts of wine, of 6 mingles; but in meaſuring brandy, it conſiſts of 6 $\frac{1}{6}$ mingles. The aume is divided into 4 anckers, and the ancker into 2 ſteckans, or 32 mingles. The ancker is taken ſometimes for $\frac{1}{24}$ a ton, or 4 barrels, on which footing the bourdeaux-barrel ought to contain at Amſterdam (when the caſk is made according to the juſt gauge) 12 $\frac{1}{2}$ ſteckans or 200 mingles, wine and lees; or 1 ſteckans, or 192 mingles racked wine; ſo that the bourdeaux-ton of wine contains 50 ſteckans, or 800 mingles, wine and lees; and 48 ſteckans, or 768 mingles of pure wine. The barrels or poinçons of Nantes and other places on the river Loire, contain only 12 ſteckans amſterdam meaſure. The wine-ton of Rochelle, Cognac, Charente, and the Iſle of Rhé, differs very little from the ton of Bourdeaux, and conſequently from the barrels and pipes. A ton of wine of Chaloſſe, Bayonne, and the neighbouring places, is reckoned 60 ſteckans, and the barrel 15, amſterdam meaſure.

T

The muid of Paris contains 150 quarts, or 300 pints, wine and lee; or 280 pints clear wine; of which muids 3 make a ton, and the fractions are

The muid	containing	36	ſetiers
The ſetier		4	quarts
The quart		2	pints
The pint		2	chopins
The chopin		2	demi-ſetiers
The demi ſetier		2	poiſſons.

The muid is alſo compoſed of pipes, or poinçons, quarteaux, queves, and demi-queves: theſe poinçons of Paris and Orleans contain about 15 ſteckans amſterdam-meaſure, and ought to weigh with the caſk 666 lb. a little more or leſs. In Provence they reckon by milleroles, and the millerole of Toulon contains 66 paris-pints, or 100 pints of Amſterdam, nearly; and the paris-pint is nearly equal to the engliſh wine-quart.

The butts or pipes from Cadiz, Malaga, Alicant, Benecarlo, Saloe, and Mataro, and from the Canaries, from Liſbon, Oporto, and Fayal, are very different in their gauges, though in affreightments they are all reckoned two to the ton.

Vinegar is meaſured in the ſame manner as wine; but the meaſures for brandies are different: theſe ſpirits from France Spain, Portugal, &c. are generally ſhipped in large caſks called pipes, butts, and pieces, according to the places from whence they are exported, &c. In France, brandy is ſhipped in caſks called pieces at Bourdeaux, and pipes at Rochelle, Cognac, the Iſle of Rhé, and other neighbouring places, which contain ſome more and ſome leſs, even from 60 to 90 amſterdam-verges or veertels, according to the capacity of the veſſels, and the places they come from, which being reduced into barrels, will ſtand as follows, *viz.*

At Rochelle, Cognac, the Iſle of Rhé, and the country of Aunis	27	Veertels
At Nants, and ſeveral places of Bretagne and Anjou	29	Veertels
At Bourdeaux, and different parts of Guienne	32	Verges
At Amſterdam, and other cities of Holland	30	Veertels
At Hamburgh and Lubeck	30	Verges
At Embden	27	Verges

} per barrel.

In Provence and Languedoc, brandy is ſold by the quintal, the caſks included; and at Bruges, in Flanders, the verges are called ſeſters of 16 ſtops each, and the ſpirit is ſold at ſo much per ſtop.

Olive-oil is alſo ſhipped in caſks of various ſizes, according to the cuſtom of the places where it is embarked, and the conveniency of ſtowage. In England it is ſold by the ton of 236 gallons; and at Amſterdam by the ton of 717 mingles, or 1434 pints. In Provence it is ſold by milleroles of 66 paris-pints: from Spain and Portugal it is brought in pipes, or butts, of different gauges; at the firſt place it is ſold by roves, whereof 40 go to the butt; and at the latter place by almoudas, whereof 26 make a pipe. Train-oil is ſold in England by the ton, at Amſterdam by the barrel.

MEASURES *of capacity for things dry.* Engliſh dry or corn meaſures are raiſed from the wincheſter-gallon, which contains 272¼ ſolid inches, and ought to hold of pure running water 9 pounds 13 ounces. This ſeems to ſtand on the foot of the old wine-gallon of 224 cubic inches, 12 being to $14\frac{12}{20}$ as 224 to 272¼; but by an act of parliament made in 1697 it is decreed, that a round buſhel, 18½ inches wide, and 8 deep, is a legal wincheſter-buſhel. Now ſuch a buſhel will only hold 2150.42 cubic inches, conſequently the gallon will hold 268.8 cubic inches, the diviſions and multiples whereof are as in the following table:

Engliſh Dry or Corn-meaſure.

Solid inches					
33.6	Pint				
268.8	8	Gallon			
537.6	16	2	Peck		
2150.4	64	8	4	Buſhel	
17203.2	512	64	32	8	Quarter.

Scripture

Scripture-MEASURES of Capacity for things dry, reduced to Engliſh Corn-meaſure.

							Peck	Gal.	Pint.	Solid inch. Dec.
Gachal						—	0	0	0 17/120	0.032
20	Cab					—	0	0	2 5/6	0.073
36	1 4/5	Gomor				—	0	0	5 1/10	1.211
120	6	3 1/3	Seah			—	1	0	1	4.036
360	18	10	3	Epha		—	3	0	3	12.107
1800	90	50	15	5	Leteeh	—	16	0	0	26.500
3600	180	100	30	10	2	Chomer, or Coron	32	0	1	18.969

Attic MEASURES of Capacity for things dry, reduced to Engliſh Corn-meaſure.

						Peck	Gal.	Pint.	Solid inch. Dec.
Cochliarion					—	0	0	0	0.276 7/10
10	Cyathos				—	0	0	0	2.763 1/2
15	1 1/2	Oxybaphon			—	0	0	0	4.144 3/4
60	6	4	Cotyle		—	0	0	0	16.579
120	12	8	2	Xeſtes	—	0	0	0	33.158
180	18	12	3	1 1/2	Choenix	0	0	1	15.705 1/4
8640	864	576	144	72	48	Medimnos	4	0	6	3.501

Roman MEASURES of Capacity for things dry, reduced to Engliſh Corn-meaſure.

						Peck	Gal.	Pint.	Solid inch. Dec.
Ligula					—	0	0	0 1/48	0.05
4	Cyathus				—	0	0	0 1/12	0.0
6	1 1/2	Acetabulum			—	0	0	0 1/8	0.0
24	6	4	Hemina		—	0	0	0 1/2	0.2
48	12	8	2	Sextarius	—	0	0	1	0.4
384	96	64	16	8	Semimodius	0	1	0	3.8
768	192	128	32	16	2	Modius	1	0	0	7.6

In the ſeveral parts of Europe, ſalt, which is a more ſtaple and current commodity than any other, is bought and ſold by different meaſures, according to the ſeveral places of its diſpatch: at Amſterdam it is ſold by the cent of 404 meaſures, or ſcheppels, which cent is reckoned to be 7 laſts, or 14 tons, and the laſt is to weigh 4000 lb. the 7 laſts making 28000 lb. called the cent of ſalt, which alſo contains 208 ſacks; though ſome of this commodity is much heavier than others. In the cities of France, ſalt is ſold by the muid, whoſe ſize varies according to the different places of its manufacture and diſpatch. At Paris this meaſure is reckoned to contain 12 ſetiers, or 48 minots, which minot is alſo divided into other meaſures. The cent of ſalt from Marans, Brouage, Sude, and the Iſle of Rhé, contain 28 ſtricken muids, and each muid 24 boiſeaux, which yields at Amſterdam 11½ laſts, or 23 tons, more or leſs. In Copenhagen the ſaid cent renders only 9½ laſts, the laſt being reckoned here equal to 18 tons, and 50 laſts to correſpond with 52 of Coningſberg, at which place the cent produces about 10 laſts, or 40000 lb. At Riga the ſaid cent yields the ſame meaſure as at Coningſberg, and about 6¼ laſts of Riga make the great cent of Amſterdam. The ſaid french cent produces at Dantzick from 11½ to 12 laſts, of which laſts from 7¼ to 7½ make likewiſe the great cent.

cent of Amſterdam. At Stetin in Pomerania, the french cent yielded ten laſts, making 40,000 meaſure and weight of the ſaid place. In Portugal it is bought by the muid, of which four make a laſt, and ſeven the cent of Amſterdam. At Alamat and Ivica it is ſold by the modin, which weighs from 27½ to 28 hundred weight engliſh.

MEASURE *of wood*, for firing. See the article CORD *of wood*.

MEASURE *for horſes*, is the hand, which by ſtatute contains four inches.

MEASURE is alſo uſed to ſignify the cadence and time obſerved in poetry, dancing, and muſic, to render them regular and agreeable. See METRE.

MEASURE, in muſic, the interval or ſpace of time which the perſon who beats time takes between the riſing and falling of his hand, in order to conduct the movement ſometimes quicker and ſometimes ſlower, according to the muſic or ſubject that is to be ſung or played. See TIME.

MEAT, *cibus*, in medicine. See the articles FOOD, DIET, DRINK, *&c.*

MEATH, the name of two counties in Ireland, in the province of Leinſter, diſtinguiſhed by the epithets eaſt and weſt.

MEATUS AUDITORIUS, in anatomy, the auditory paſſage. See EAR.

The entrance of this paſſage is guarded by hairs, as well to keep out foreign bodies, as to break the impetus of the external air; and for much the ſame purpoſes does the cerumen, or ear-wax, ſerve. See the article CERUMEN.

Anatomiſts likewiſe gave the name of meatus cyſticus, to the biliary duct; and meatus urinarius, to the urinary paſſage in women. See BILE, URINE, *&c.*

MEAUX, a city of France, twenty-four miles north eaſt of Paris.

MEB, or WINDER-MEB, a bird of the larus or gull-kind, about the ſize of a widgeon. See the article LARUS.

MECCA, the capital of Arabia, and place of Mahomet's nativity: eaſt long. 43° 30′, north lat. 21° 20′.

It is a large well-built city, in the middle of which ſtands the caaba, or temple. See the article CAABA.

MECHANICS, that branch of practical mathematics which conſiders motion and moving powers, their nature and laws, with their effects in machines. See the article MACHINE.

The term mechanics is equally applied to the doctrine of the equilibrium of powers, more properly called ſtatics; and to that ſcience which treats of the generation and communication of motion, which conſtitutes mechanics ſtrictly ſo called. See STATICS, POWER, MOTION, *&c.*

The knowledge of mechanics is one of thoſe things, ſays Mr. Mac Laurin, that ſerves to diſtinguiſh civilized nations from barbarians. It is by this ſcience, that the utmoſt improvement is made of every power and force in nature; and the motions of the elements, water, air, and fire, are made ſubſervient to the various purpoſes of life: for however weak the force of man appears to be, when unaſſiſted by this art; yet, with its aid, there is hardly any thing above his reach. It is diſtinguiſhed, by Sir Iſaac Newton, into practical and rational mechanics; the former of which treats of the mechanical powers, *viz.* the lever, balance, axis and wheel, pulley, wedge, ſcrew, and inclined plane. See the articles LEVER, BALLANCE, *&c.*

Rational mechanics comprehends the whole theory of motion; ſhews, when the powers of forces are given, how to determine the motions that are produced by them; and, converſely, when the phænomena of the motions are given, how to trace the powers or forces from which they ariſe. See MOTION.

Thus it appears, that the whole of natural philoſophy, beſides deſcribing the phænomena of nature, is little more than the proper application of rational mechanics to thoſe phænomena: in tracing the powers that operate in nature from the phænomena, we proceed by analyſis; and in deducing the phænomena from the powers or cauſes that produce them, we proceed by ſyntheſis. But in either caſe, in order to proceed with certainty, and make the greateſt advances, it is neceſſary that the principles of mechanics ſhould be clearly eſtabliſhed; which has already been done under the articles INERTIA, GRAVITY, EXPERIMENTAL PHILOSOPHY, and COMMUNICATION *of motion*.

For though the cauſes of the motions, the nature of the impreſt force, or of the reſiſtance, be unknown or obſcurely underſtood; yet this obſcurity does not hinder us from tracing its effects in mechanics with ſufficient evidence, provided we can ſubject its action to a juſt menſuration: and, in fact, we know that excellent contrivances have been invented for raiſing weights, and overcoming their reſiſtances, by thoſe who gave themſelves

no trouble to enquire into the cauſe of gravity.

The mechanical powers, according to their different ſtructure, ſerve for different purpoſes; and it is the buſineſs of the ſkilful mechanic to chooſe them, or combine them, in the manner that may be beſt adapted to produce the effect required, by the power he is poſſeſſed of, and at the leaſt expence. The lever can be employed to raiſe weights a little way only, unleſs the engine itſelf be moved; as, for example, to raiſe ſtones out of their beds, in quarries. But the axis and wheel ſerve for raiſing weights from the greateſt depths. The pullies being eaſily portable aboard ſhips, are therefore much employed in them. The wedge is excellent for ſeparating the parts of bodies; and the ſcrew, for compreſſing or ſqueezing them together; and its great friction is ſometimes of uſe, to preſerve the effect already produced by it.

The ſtrength of every engine, and of all its parts, muſt be proportioned to the effects which they are to produce. And as we found, when treating of the lever, that the fulcrum placed between the power and weight muſt ſuſtain the ſum of their efforts, therefore a ſmall balance ought not to be employed for weighing great weights; neither, on the other hand, are great engines proper for producing ſmall effects. See the articles ENGINE, MILL, &c.

But beſides the raiſing of weights, and overcoming reſiſtances, we have often other objects in view; as to make clocks and watches, to meaſure time as exactly as poſſible; and to conſtruct machines, that by their movements, may illuſtrate the motions of the heavenly bodies, as orreries, planetariums, cometariums, &c. See the articles CLOCK, ORRERY, PLANETARIUM, &c.

MECHANICAL, an epithet applied to whatever relates to mechanics: thus we ſay, mechanical powers, cauſes, &c. See the articles POWER, CAUSE, &c.

The mechanical philoſophy is the ſame with what is otherwiſe called corpuſcular philoſophy. See CORPUSCULAR.

This manner of reaſoning is much uſed in medicine, and according to Dr. Quincy, is the reſult of a thorough acquaintance with the ſtructure of animal bodies: for conſidering an animal body as a compoſition out of the ſame matter, from which all other bodies are formed, and to have all thoſe properties which concern a phyſician's regard, only by virtue of its peculiar conſtruction; it naturally leads a perſon to conſider the ſeveral parts, according to their figures, contexture, and uſe, either as wheels, pullies, wedges, levers, ſcrews, cords, canals, ſtrainers, &c. For which purpoſe, continues he, it is frequently found helpful to deſign in diagrams, whatſoever of that kind is under conſideration, as is cuſtomary in geometrical demonſtrations.

For the application of this doctrine to the human body, ſee the article HUMAN.

MECHANICAL, in mathematics, denotes conſtruction of ſome problem, by the aſſiſtance of inſtruments, as the duplicature of the cube and quadrature of the circle, in contradiſtinction to that which is done in an accurate and geometrical manner.

MECHANICAL CURVE, is a curve, according to Deſcartes, which cannot be defined by any algebraic equation: and ſtands contradiſtinguiſhed from algebraic or geometrical curves.

Leibnitz and others call theſe mechanical curves tranſcendental, and diſſent from Deſcartes in excluding them out of geometry. Leibnitz found a new kind of tranſcendental equations, whereby the curves are defined: but they do not continue conſtantly the ſame in all points of the curve, as algebraic ones do. See the article TRANSCENDENTAL.

MECHLIN, a large well built and fortified city of Brabant, twelve miles north-eaſt of Bruſſels.

MECHOACAN, a province of Mexico, bounded by Panuco, on the north; by Mexico Proper, on the eaſt; by the Pacific ocean, on the ſouth; and by Guadalajara, or New Galicia, on the weſt.

MECHOACAN, in the materia medica, a large root of a plant of the convolvulus or bindweed-kind. It is of a ſomewhat rough ſurface, marked with ſeveral imperfect annular furrows; but it is always ſent over in ſlices, to which it has been cut for the convenience of drying. The root in powder is a gentle and mild purgative: it does not occaſion ſickneſs or gripings during its operation: and is recommended by many in preference to jalap in all chronic caſes occaſioned by obſtructions of the viſcera; but is now little uſed. Its doſe is from one to two drams.

MECKLENBURG DUTCHY, a province of Germany, in the province of Lower Saxony, about 100 miles long, and

broad; bounded by the Baltic ſea, on the north; by Pomerania, on the eaſt; by Brandenburg, on the ſouth; and by the dutchies of Holſtein, Lunenburg and Lawenburg, on the weſt.

MECON, a great river, which riſes in the north of further India, and running ſouth through the kingdoms of Laos and Cambodia, falls into the Indian ocean.

MECONIUM, in medicine, a black thick fæces gathered in the inteſtines of infants and brought with them into the world at the time of their birth. The retention of theſe fæces is one of the diſeaſes to which infants are liable; for the cure of which, ſee the article INFANT.

MECONIUM, in pharmacy, the extract of engliſh poppies.

Meconium has all the virtues of the foreign opium, but in a ſomewhat lower degree. See the article OPIUM.

MEDAL, a piece of metal in the form of coin, intending to convey to poſterity the portrait of ſome great perſon, or the memory of ſome illuſtrious action.

The parts of a medal are the two ſides, one of which is called the face, or head, and the other the reverſe. On each ſide is the area, or field, which makes the middle of the medal; the rim, or border; and the exergum: and on the two ſides are diſtinguiſhed the type, or the figure repreſented, and the legend, or inſcription.

As to the antiquity of medals, the greek are certainly the moſt antient; for long before the building of Rome, the Greeks had beautiful money in gold, ſilver, and copper. This plainly appears from ſeveral genuine medals of Macedon, older than Philip and Alexander; from greek medals with the names of ſeveral magiſtrates prior to the macedonian empire; to which we may add ſome ſicilian coins of ſtill greater antiquity. As the greek medals are the moſt antient, ſo are they the moſt beautiful; they have a deſign, accuracy, force and delicacy that expreſſes even the muſcles and veins, and are ſtruck with ſuch exquiſite art, as the Romans could never come up to. Thoſe ſtruck when Rome was governed by conſuls, are the moſt antient among the Romans: but the copper and ſilver medals do not go beyond the 484th year of Rome, nor the gold, beyond the year 546. Among the imperial medals, we diſtinguiſh between the upper and lower empire: the firſt commenced under Julius Cæſar, and ended A. D. about 260; the lower empire includes near 1200 years, and ends at the taking of Conſtantinople. It is the cuſtom, however, to account all the imperial medals till the time of the Paleologi, among the antique tho' we have none of any conſiderable beauty later than the time of Heraclius, who died in 641. The gothic medals make part of the imperial ones. Modern medals are thoſe ſtruck within theſe 300 years. There are no true hebrew medals, except a few ſhekels of copper and ſilver, but none of gold; tho' there is mention made of one in the king of Denmark's cabinet.

There was formerly no difference between money and medals. An old Roman had his purſe full of the ſame pieces that we now preſerve in cabinets. As ſoon as an emperor had done any thing remarkable, as gaining a victory, giving up a tax, or the like, it was immediately ſtamped on a coin, and became current through his whole dominions. This was a pretty device to ſpread abroad the virtues of an emperor, and make his actions circulate; and thus a freſh coin was a kind of gazette, that publiſhed the lateſt news of the empire.

Several of our modern coins have the legend round the edges: but the antients were too wiſe to regiſter their exploits on ſo nice a ſurface. As to the figures upon medals, the Romans always appear in the proper dreſs of their country, ſo that we may obſerve the little variations of the mode in the drapery of the medal: they would have thought it ridiculous to have drawn an emperor of Rome in a grecian cloak, or a phrygian mitre. On the contrary, we often ſee a king of England or France, dreſſed up like a Julius Cæſar, as if they had a mind to paſs themſelves upon poſterity for roman emperors. Nothing is more uſual than to ſee alluſions to roman cuſtoms and ceremonies on the medals of our own nation; nay, they very often carry the figure of an heathen god. If poſterity take its notions of us from our medals, they muſt fancy that one of our kings paid a great devotion to Minerva, another to Apollo, &c. or, at leaſt, that our whole religion was a mixture of paganiſm and chriſtianity. Had the old Romans been guilty of the ſame extravagance, there would have been ſo great a confuſion in their antiquities, that their coins would not have had half the uſe we now find in them.

The uſe of medals is very conſiderable: they give a very great light into hiſtory, in confirming ſuch paſſages as are true in old authors, in reconciling ſuch as are told in different manners, and in recording ſuch as have been omitted. In this caſe a cabinet of medals is a body of hiſtory. It was, indeed, the beſt way in the world to perpetuate the memory of great actions, thus to coin out the life of an emperor, and to put every exploit into the mint. It was a kind of printing before the art was invented; and they have this advantage over books, that they tell their ſtory quicker, and ſum up a whole volume in twenty or thirty reverſes: thus Mr. Vaillant, out of a ſmall collection of medals, has given us a chronicle of the kings of Syria. They are, indeed, the beſt epitomes in the world, and let us ſee, with one caſt of the eye, the ſubſtance of above an hundred pages. Another uſe of medals is, that they not only ſhew the actions of an emperor, but at the ſame time mark out the year in which they were performed; for as every exploit has its date ſet to it, a ſeries of an emperor's coins is his whole life digeſted into annals. A medalliſt, upon the firſt naming of an emperor, will immediately tell his age, family, and life. To remember where he enters in the ſucceſſion, he only conſiders in what part of the cabinet he lies; and by running over in his thoughts ſuch a particular drawer, will give an account of all the remarkable parts of his reign. Nor are medals of leſs uſe in architecture, painting, poetry, *&c.* A cabinet of medals is a collection of pictures in miniature, and by them the plans of many of the moſt conſiderable buildings of antiquity are preſerved.

Impreſſions of MEDALS. A very eaſy and elegant way of taking the impreſſions of medals and coins, not generally known, is thus directed by Dr. Shaw: melt a little iſinglaſs-glue made with brandy, and pour it thinly over the medal, ſo as to cover its whole ſurface; let it remain on for a day or two, till it is thoroughly dry and hardened, and then taking it off, it will be fine, clear, and hard, as a piece of muſcovy-glaſs, and will have a very elegant impreſſion of the coin.

Another eaſy method is as follows: Take a perfect and ſharp impreſſion in the fineſt black ſealing-wax, of the coin or medal you deſire. Cut away the wax round the edges of the impreſſion; then with a preparation of gum water, of the colour you would have the picture, ſpread the paint upon the wax-impreſſion with a ſmall hair-pencil, obſerving to work it into all the ſinking or hollow places, theſe being the riſing parts of the medal; and the colour muſt be carefully taken from the other parts with a wet finger. Then take a piece of very thin poſt-paper, a little larger than the medal, and moiſten it quite through. Place it on the wax-impreſſion, and on the back of the paper lay three or four pieces of thick woollen cloth or flannel, of about the ſame ſize. The impreſſion, with its coverings, ſhould be placed between two ſmooth iron plates, about two inches ſquare, and one tenth of an inch thick. Theſe muſt be carefully put into a ſmall preſs, made of two plates of iron, about five inches and a half long, one inch and a half wide, and half an inch in thickneſs, having a couple of long male ſcrews running thro' them, with a turning female ſcrew on each, to force the plates together. Theſe being brought evenly together, by means of the ſcrews, will take off a true and fair picture of the medal; which, if any deficiencies ſhould appear, may eaſily be repaired with a hair pencil, or pen, dipped in the colour made uſe of.

If a relievo only be deſired, nothing is neceſſary, but to take a piece of card, or white paſte-board, well ſoaked in water, then placing it on the wax-mould, without any colouring, and letting it remain in the preſs for a few minutes, a good figure will be obtained.

This method of taking off medals, &c. is convenient, and ſeems much more ſo than the ſeveral inventions uſually practiſed in ſulphur, plaſter of Paris, paper, *&c.* wherein a mould muſt be formed either of clay, horn, plaſter, or other materials, which requires a good deal of time and trouble.

MEDALLION, or MEDALION, a medal of an extraordinary ſize, ſuppoſed to be antiently ſtruck by the emperors for their friends, and for foreign princes and embaſſadors; but that the ſmallneſs of the number might not endanger the loſs of the devices they bore, the Romans generally took care to ſtamp the ſubject of them upon their ordinary coins.

Medallions, in reſpect of the other coins, were the ſame as modern medals in reſpect of modern money: they were exempted from all commerce, and had no other value but what was ſet upon them by the fancy of the owner. Medalli-

are ſo ſcarce that there cannot be any ſet made of them, even though the metals and ſizes ſhould be joined promiſcuouſly.

MEDELIN, a town of Spain, twenty miles eaſt of Merida.

MEDELPADIA, a ſmall province of Sweden lying northward of Helſingia.

MEDENBLICK, a port-town of Holland, ſituated on the Zuyder ſea, ten miles north of Hoorn.

MEDEOLA, in botany, a genus of the hexandria-trigynia claſs of plants, the flower of which conſiſts of ſix oblong, patent, and revolute petals: the fruit is a berry of a roundiſh form, with three cells, in each of which is contained a ſingle cordated ſeed.

MEDIA, in geography, the antient name of Gilan. See the article GILAN.

MEDIAL, or ALLIGATION MEDIAL, in arithmetic. See ALLIGATION.

MEDIAL VOICE, *vox media*, in greek grammar. See the article VOICE.

MEDIANA, a vein formed by the concourſe of the cephalic and baſilic veins in the bend of the elbow.

MEDIASTINA, in anatomy, a name given to both a vein and an artery of the mediaſtinum. See the next article.

MEDIASTINUM, in anatomy, is a double membrane continuous to the ſternum, ſituated under it, and adhering firmly to it. It divides the cavity of the thorax longitudinally into two parts; but as it is not exactly under the middle of the ſternum, but ſomewhat to the left ſide, the right part of the thorax is larger than the left.

The mediaſtinum is connected with the ſternum, pleura, pericardium, and other adjoining parts. It receives veins and arteries from the mammary and diaphragmatic veſſels, and ſometimes has proper and particular ones of its own from the aorta and cava: theſe are then called the mediaſtinal veſſels. Its nerves, which are ſmall, are from the diaphragmatics and the par vagum. It has alſo a number of lymphatics, which run to the ductus thoracicus.

The uſes of the mediaſtinum are two. The firſt is to divide the breaſt longitudinally into two parts, by which ſeveral great purpoſes are anſwered; as, 1. That on one of the lobes of the lungs being ulcerated, the other might not be immediately affected. 2. That water, matter, or any thing elſe contained in one part of the thorax, might not at the ſame time affect both parts of the lungs. 3. That in caſe of a wound in one ſide of the thorax, reſpiration might be continued in the other, and the perſon not be immediately ſuffocated. The ſecond general uſe of the mediaſtinum, is to ſupport the heart in its pendulous ſtate, for the benefit of its free motion, eſpecially when we lie on our backs.

MEDIASTINUM CEREBRI, the ſame with the tranſverſe ſeptum of the brain. See the article BRAIN.

MEDIATE, or INTERMEDIATE, ſomething that ſtands between and connects two or more terms, conſidered as extremes; in which ſenſe it is oppoſed to immediate.

MEDICAGO, in botany, a genus of the diadelphia decandria claſs of plants, with a papilionaceous flower, and a long compreſſed and crooked pod for its fruit.

This genus comprehends the medicago, medica falcata, and cochleata of authors.

MEDICINE, *medicina*, the art which treats of the means of preſerving health, when preſent; and of reſtoring it, when loſt.

If we look back to the origin of the art of medicine, we ſhall find its firſt foundations to be owing to mere chance, unforeſeen events, and natural inſtinct: in the early ages, the ſick were placed in croſs-ways, and other public places, to receive the advice of thoſe paſſengers who knew an efficacious remedy ſuitable to their diſorder. And the better to preſerve the memory of a remarkable cure, both the diſeaſe and the remedy were engraved on pillars, or written on the walls of temples, that patients in the like caſes might have recourſe to them for inſtruction and relief. Thus what mere accident had diſcovered, was regiſtered in theſe chronicles of health. This art aroſe from repeated trials and long experience, which gave an inſight into the virtues of herbs and plants, metals and minerals.

As to the part which reaſon has acted in the improvement of medicine, it ſeems to have conſiſted in obſerving, 1. That diſeaſes attended with particular circumſtances, called ſymptoms, were ſometimes cured without the aſſiſtance of art, by ſpontaneous evacuations, as hæmorrhages, diarrhœas, vomitings, or ſweats; whence bleeding, purges, and vomits took their riſe. 2. That the patients were often relieved, by the breaking out of various tumours; whence aroſe the application of topical remedies. And, indeed, it is the beſt method of improving

ing phyſic, to obſerve carefully what means nature, unaſſiſted by art, employs to free the conſtitution from diſtempers; ſince many important hints may be thence taken, for the relief of other patients under the like circumſtances.

So much for the riſe of this art. Let us now ſay ſomething of the regular method of ſtudying it. And firſt, with Boerhaave, let us imagine the young ſtudent laying the foundation of his art in the contemplation of geometrical figures, bodies, weights, meaſures, velocity, the fabric of machines, and the power of acting upon other bodies thence ariſing. While he employs his thoughts about theſe matters, he is likewiſe taught a juſt method of reaſoning; after which he may proceed to inform himſelf of the properties of fluidity, elaſticity, tenuity, weight, and tenacity of liquids, from hydroſtatics. His reaſon being by this time much improved, he next applies to ſtudy the forces of fluids upon machines, and of theſe upon fluids; and to demonſtrate them by mathematics, confirm them by hydroſtatics, and illuſtrate them by chemical experiments; at the ſame time entertaining himſelf with ſpeculations on the nature of fire, water, air, ſalts, and other homogeneous bodies. Having laid this foundation, his next buſineſs is to apply himſelf to the ſtudy of anatomy, in order to obtain a clear idea of the human fabric. To this he joins the knowledge of the vital fluids, and examines them with the aſſiſtance of anatomy, chemiſtry, hydroſtatics, and even of the microſcope; and ſo now you ſee him qualified for writing a theory of health, and inveſtigating the cauſes of diſeaſes. Now behold him buſied in furniſhing himſelf with medicinal obſervations, from all quarters; ſometimes he diſſects the dead bodies of perſons, whoſe diſeaſes he had obſerved; at other times, he marks the ſymptoms of ſickneſs procured by art in brutes; and at length collecting together all the effects of diſeaſes, with their remedies, whether learned from his own experience, or found in the beſt authors, he digeſts, conſiders, and compares them with thoſe which are demonſtrated by theory. This, he tells us, is the method which he took himſelf, and which he recommended to his pupils, in order to gain a thorough knowledge of medicine.

If, then, he would advance the healing art, he ought to collect a ſelect treaſure of practical obſervations, reſt ſatisfied with a few but well choſen medicines, be thoroughly acquainted with their virtues and efficacy in different conſtitutions and diſeaſes, deſpiſe the cumberſome load of recipes with which practical writers of an inferior rank abound, reject the ſo much extolled medicines of the chemiſts, and attempt the relief of patients by a proper diet and exerciſe, and ſuch medicines as obſervation and ſound philoſophy recommend: for to the improvement of anatomy and natural philoſophy is much of the ſucceſs of phyſic to be attributed.

The knowledge of medicines, or ſuitable remedies, is alſo highly neceſſary to phyſicians; who, in order to moderate the impetus in acute diſorders, make evacuations, blunt acrimony, dilute too thick fluids, condenſe thoſe that are too thin, brace up too lax parts, and relax ſuch as are too much conſtricted; they alſo derive the humours to parts where they will be leaſt prejudicial, upon occaſion mitigate pain, and in languors, uſe ſtimulating medicines. Wine, vinegar, barley, nitre, honey, rhubarb, opium, and other ſimples, are found both ſafe and powerful medicines. Sydenham tells us, that all manner of diſeaſes may be cured by bleeding, purging, with a ſubſequent opiate, and proper regimen. In chronical caſes, mineral waters, ſalts, diaphoretics, ſoap, mercury, ſteel, with a few vegetables, and proper exerciſe, will generally effect the cure.

As to the drugs recommended by the antients, adds Boerhaave, we are, and always ſhall be ignorant of them, unleſs perhaps a few; ſince they contented themſelves with giving the virtues; omitting the deſcription of plants, as things well known. The moderns, on the other hand, have been accurate in the deſcriptive part, but have given us very little concerning the virtues of plants, except what they tranſcribed from the antients, and this upon an uncertain ſuppoſition of the plants being the ſame. To conclude, what is there in the moſt elaborate preparation, that is worth half the pains taken about it? Mercury, opium, the peruvian bark, and other ſimples, with fire and water, are acknowledged as the ſureſt remedies by the ableſt maſters of the art; and theſe are found to be more efficacious in that crude ſtate, in which bountiful nature has imparted them to us, than after the moſt operoſe and artificial preparations,

We

We can despair of nothing, while we follow simplicity; but the event of intricate labour is fallacious.

As to the general divisions of medicine, they are these. 1. Physiology, or the doctrine of the animal œconomy, the use of the several parts, whether solids, vessels, or fluids: under this branch is comprehended anatomy. 2. Hygieine, which lays down rules for the preservation of health, and the prolongation of life: its objects are chiefly the six non-naturals. 3. Pathology, or the doctrine of diseases, their differences, causes, symptoms, and other accidents. 4. Semeiotice, is that part of medicine which treats of the signs of diseases, and their use; as also how the various degrees and effects of health and sickness may be known. 5. Therapeutace, is the last and principal part, comprehending diet, pharmacy, surgery, and the method of cure; considering the materia medica, the preparation of remedies, and the manner of using them, in order to recover health and banish diseases. See the article PHYSIOLOGY, *&c.*

MEDICINES, *medicamenta*, whatever substances serve to restore health. See the article MATERIA MEDICA, *supra*.

Medicines are either simple or compound; the former being formed by nature alone, and the latter owing to the industry of men, by variously mixing the simple ones together.

Medicines are likewise distinguished, from the manner of using them, into internal or external; and with regard to their effects, they are said to be astringent, cathartic, emetic, *&c.* See ASTRINGENTS, CATHARTICS, *&c.*

Mechanical operation of MEDICINES. To account for the operations of medicines mechanically, seems to have been the favourite scheme of physicians and physiologists of the last and present century. Stahl and his disciples reject these accounts, and think them sufficiently refuted by the operation of opium, and of astringents. One grain of opium, properly taken, will, for a time, assuage pains all over the body. A very few grains of crocus martis astringens sometimes stop an hæmoptysis, before they can be supposed to have entered into the humours of the body. Is it not past all belief, say they, that so few grains, mixed with so many pounds of fluids, should retain any mechanical force, especially as it is well known, that astringents lose their force by dilution. They farther urge, that the various effects of the same medicine are a refutation of the mechanical hypothesis; thus emetics sometimes purge, and *vice versa*; astringents encrease hæmorrhages; opium excites alacrity in some instead of stupifying. Again, the sight, or even bare imagination of some medicines, will produce a sensible effect on the body, without any contact. Stahl and his followers therefore hold, that medicines operate chiefly by exciting the vital sense; and that this is the chief effect of medicines, even where they seem most to act mechanically.

Hoffman, Heister, and others, have attacked the hypothesis of Stahl. We shall not pretend to give any farther account of the controversy. Perhaps in this, as in others, there may be a good deal of logomachy. Strictly speaking, mechanical principles must be insufficient to account for the operation of medicines, as this sometimes undoubtedly depends (in the primæ viæ at least) on chemical principles; and no body has hitherto been able to account mechanically for the phænomena of chemistry. The laws of the minima naturæ have not hitherto been reduced to those of the pressure and impulse of large sensible masses. And perhaps when the laws, that obtain in the minute parts of matter, have been found, we shall still be at a loss to account for all the phænomena of animated bodies, particularly the human.

Pocket-MEDICINES, in surgery, those which a surgeon ought to carry always about him, in a box or convenient case. Those, according to Heister, are the common digestive ointment, and the brown or egyptian ointment, for cleansing and digesting foul ulcers, and some vulnerary balsams, as the linimentum Arcæi, or the balsam of Peru, of Gilead or Capivi, or the Samaritan balsam: to these must also be added a plaster or two, as the diachylon, or stypticum Crollii, since one or other of these is almost constantly wanted. Neither should there be wanting a piece of blue vitriol for the taking down luxuriant flesh, and to stop hæmorrhages; but if vitriol is wanting, burnt alum, red precipitate, the infernal stone, or any other corrosive medicine, will supply its place in corrosive intentions, and the last will also serve to open abscesses, to make issues, and perform many other operations of that kind.

With these there should always be kept in

in readineſs alſo a quantity of ſcraped lint, that the ſurgeon may be able to give immediate aſſiſtance to wounded perſons, ſince, if he is unprepared for this, they may eaſily be taken off by an hæmorrhage; a circumſtance which ought alſo to prevail with him to be always provided with ſuitable bandages. See the article BANDAGE.

MEDIETAS LINGUÆ, in law, ſignifies a jury, or inqueſt impanelled, of which the one half are natives of this land, and the other foreigners. This jury is never uſed except where one of the parties in a plea is a ſtranger, and the other a denizen. In petit-treaſon, murder, and felony, foreigners are allowed this privilege, but not in high-treaſon, becauſe an alien in that caſe ſhall be tried according to the rules of the common law, and not by a medietas linguæ. A grand jury ought not in any caſe to be of a medietas linguæ, and the perſon that would have the advantage of a trial in this way, is to pray the ſame, otherwiſe it will not be permitted on a challenge of the jurors.

MEDIMNUS, μεδιμνος, in grecian antiquity, a meaſure of capacity. See the article MEASURE.

MEDINA, a city of Arabia Deſerta, ſituated two hundred miles north-weſt of Mecca: in eaſt long. 40° 35′, north lat. 24° 30′.

This is called the city of the prophet, on account of Mahomet's being received and protected by the inhabitants on his flight hither from Mecca, where the mahometan æra commences.

MEDINA CELI, a city of Spain, in the province of Old Caſtile, and territory of Siquenca, ſituated in weſt long. 2° 45′, north lat. 40° 20′.

MEDINA SIDONIA, a city of Spain, in the province of Andaluſia, twenty miles eaſt of Cadiz.

MEDINA DEL RIO SECCO, a city of Spain, in the province of Leon, fifty two miles ſouth-eaſt of the city of Leon.

MEDINA DEL CAMPO, another city of Spain, in the province of Leon, fifty miles north-eaſt of Salamanca.

MEDITERRANEAN-SEA, extends from the Straits of Gibraltar, to the coaſts of Syria and Paleſtine, being upwards of 2000 miles in length, but of a very unequal breadth; the weſt-part of it ſeparates Europe from Africa; and the Levant or eaſt-part of it, divides Aſia from Africa. See EUROPE, &c.

MEDITULLIUM, is uſed by anatomiſts for that ſpungy ſubſtance between the two plates of the cranium, and in the interſtices of all laminated bones. See the article DIPLOE.

MEDIUM, in logic, the mean or middle term of a ſyllogiſm, being an argument, reaſon, or conſideration for which we affirm or deny any thing: or, it is the cauſe why the greater extreme is affirmed or denied of the leſs in the concluſion. See the articles SYLLOGISM, EXTREMES, and CONCLUSION.

MEDIUM, in arithmetic, or *arithmetical* MEDIUM, or MEAN, called in the ſchools, medium rei, that which is equally diſtant from each extreme, or which exceeds the leſſer extreme as much as it is exceeded by the greater, in reſpect of quantity not of proportion: thus 9 is a medium between 6 and 12. See the article PROPORTION.

Geometrical MEDIUM, called in the ſchools medium perſonæ, is that where the ſame ratio is preſerved between the firſt and ſecond, as between the ſecond and third terms, or that which exceeds in the ſame ratio, or quota of itſelf, as it is exceeded: thus 6 is a geometrical medium between 4 and 9.

MEDIUM, in philoſophy, that ſpace or region through which a body in motion paſſes to any point; thus æther is ſuppoſed to be the medium through which the heavenly bodies move; air, the medium wherein bodies move near our earth; water, the medium wherein fiſhes live and move; and glaſs is alſo a medium of light, as it affords it a free paſſage. That denſity or conſiſtence in the parts of the medium, whereby the motion of bodies in it is retarded, is called the reſiſtance of the medium, which together with the force of gravity, is the cauſe of the ceſſation of the motion of projectiles.

Subtile or *ætherial* MEDIUM. Sir Iſaac Newton makes it probable, that beſide the particular aerial medium, wherein we live and breathe, there is another more univerſal one, which he calls an ætherial medium, vaſtly more rare, ſubtile, elaſtic and active than air, and by that means freely permeating the pores and interſtices of all other mediums, and diffuſing itſelf through the whole creation; and by the intervention hereof, he thinks it is that moſt of the great phænomena of nature are effected. This medium he ſeems to have recourſe to, as the firſt and moſt remote phyſical ſpring, and the ultimat

ultimate of all natural cauſes. By the vibrations of this medium, he takes heat to be propagated from lucid bodies, and the intenſeneſs of heat increaſed and preſerved in hot bodies, and from them communicated to cold ones. By this medium, he takes light to be reflected, inflected, refracted, and put alternately in fits of eaſy reflection and tranſmiſſion, which effects he elſewhere aſcribes to attraction; ſo that this medium appears the ſource and cauſe even of attraction. Again, this medium being much rarer within the heavenly bodies than in the heavenly ſpaces, and growing denſer as it recedes further from them, he ſuppoſes the cauſe of the gravitation of theſe bodies towards each other, and of the parts towards the bodies. Again from the vibrations of this ſame medium excited in the bottom of the eye, by the rays of light, and thence propagated through the capillaments of the optic nerves into the ſenſory, he takes viſion to be performed; and ſo hearing from the vibrations of this or ſome other medium excited in the auditory nerves by the tremors of the air, and propagated through the capillaments of the nerves into the muſcles; and thus contracting and dilating them.

The elaſtic force of this medium, he ſhews, muſt be prodigious. Light moves at the rate of 70,000,000 miles in about ſeven minutes, yet the vibrations and pulſes of this medium, to cauſe the fits of eaſy reflection and eaſy tranſmiſſion, muſt be ſwifter than light, which is 700,000 times ſwifter than ſound. The elaſtic force of this medium therefore in proportion to its denſity muſt be above 490,000,000,000 times greater than the elaſtic force of the air in proportion to its denſity; the velocities and pulſes of the elaſtic mediums, being in a ſubduplicate ratio of the elaſticities and the rarities of the mediums taken together; and thus may the vibrations of this medium be conceived as the cauſe of the elaſticity of bodies.

MEDLAR, MESPILUS, in botany, *&c.* See the article MESPILUS.

MEDNICK, a city of Poland in the province of Samogitia: eaſt long. 22° 15′, north lat. 56°.

MEDULLA, MARROW, in anatomy. See the article MARROW.

MEDULLA OBLONGATA, is the lower and medullary part of the cerebrum and cerebellum, formed into a kind of tail, and extended to the great foramen or hole in the occipital bone of the cranium, where it gives origin to the ſpinal marrow, and to the nerves of the brain. See the articles BRAIN and NERVES.

MEDULLA SPINALIS, or ſpinal marrow, is a continuation of the medulla oblongata of the brain, and forms, as it were, a tail to that part. It is included in a kind of bony canal, formed by the vertebræ, and in this is continued from the head to the extremity of the os ſacrum. Its length is therefore the ſame with that of the ſpina dorſi, which is different in perſons of different ſtature. Its thickneſs, in general, is nearly equal to that of a finger; but it is not uniformly of the ſame diameter throughout. Its ſubſtance in the upper part, as far as to the laſt vertebra of the thorax, is the ſame with that of the medulla oblongata of the brain; but ſomewhat tougher and more firm: they are externally of a medullary ſubſtance, that the nerves may eaſily make their way out; internally cineritious, and of the ſame nature with the cineritious or cortical part of the brain: but the lower part of them, from the laſt vertebra of the thorax to the extremity of the os ſacrum, is fibrous and very tenacious, and is called cauda equina. The diviſion of the ſpinal marrow is formed by means of a fiſſure: it is by this ſeparated into a right and left part, or into two columns; but this ſeparation is not continued to the center. Its proper integuments are no leſs than ſix: theſe are, 1. The bony canal, formed by the cavities of the twenty-four vertebræ, and the os ſacrum: 2. The tunica, which is very ſtrong, and connects the vertebræ within: 3. The cellular, or adipoſe coat, which, in fat perſons, always contains more or leſs fat, and ſeems deſtined by nature to ſoften the former: 4. The dura mater, which is ſtronger in the upper part, and finer and weaker in the lower; this looſely incloſes the medulla in the ſpine, and, in its anterior part, is firmly connected with the vertebræ: 5. The tunica arachnoides, which in its anterior part, adheres very firmly to the pia mater, but in its poſterior part is looſe and fluctuating: 6. The pia mater, which ſurrounds every part of the ſpinal marrow, and all the nerves that ariſe from it, and enters alſo its longitudinal diviſion. The arteries and

veins of the ſpinal marrow enter at the apertures of the vertebræ, which give paſſage out to the nerves: they make a multitude of anaſtomoſes, and are derived from the vertebrals of the neck, the intercoſtals, and the lumbar. The nerves of the ſpine are thirty-one, or as others count them, thirty-two pair. Theſe are compoſed each of a multitude of fibres, ariſing from the anterior and poſterior parts of the medulla: theſe fibres afterwards unite, and are connected by and covered with membranes, and in that ſtate they conſtitute what we call nerves.

The uſes of the ſpinal marrow are, to give origin to the before-mentioned pairs of nerves, which are principally diſtributed to the limbs and external parts; and to ſecrete and prepare a nervous fluid.

MEDUSA, in zoology, a genus of naked inſects, the body of which is of an orbiculated figure and convex, and is of a gelatinous ſubſtance, and not hairy: the tentacula, or the plicæ, which are in the place of them, are ſituated in the center of the under part of the animal.

Authors have deſcribed ſeveral of the ſpecies of this genus, under the names pulmo marinus and urtica marina. See the articles PULMO and URTICA.

MEDUSA'S HEAD, in aſtronomy. See the article ALGOL.

MEDUSA'S HEAD, in natural hiſtory, a name given by ſome to the ſtar-fiſh. See the articles STAR-FISH.

MEDWAY, a river which riſes in Aſhdown Foreſt in Suſſex, and running through Kent, is divided into two branches by the Iſle of Sheppey, one of which is called Eaſt Swale, and the other Weſt Swale.

MEETER, or METRE. See METRE.

MEGEN, a town of Dutch Brabant, ten miles ſouth-weſt of Nimeguen.

MEGIERS, a town of Tranſilvania, ſubject to the houſe of Auſtria: eaſt long. 24° 25′, north lat. 47° 5′.

MEHAIGN, a river of the Auſtrian Netherlands, which riſes in the province of Namur, and falls into the Maes, a little weſt of Huy.

MEI, or MISERERE MEI, in medicine. See the article MISERERE.

MEISSEN, once the capital of the marquiſate of Miſſen or Miſnia, in Upper Saxony, on the river Elbe, ten miles north of Dreſden.

MEL, HONEY. See the article HONEY.

MELAMPODIUM, in botany, a genus of the ſyngeneſia polygamia neceſſaria claſs of plants, the compound flower of which is radiated, and the particular hermaphrodite ones infundibuliform, and ſituated on the diſc: the ſtamina are five very ſmall filaments: the receptacle of the ſeeds is paliaceous.

MELAMPYRUM, a genus of the didynamia angioſpermia claſs of plants, with a ringent monopetalous flower, and a roundiſh bilocular capſule for its fruit, containing a number of ſeeds.

MELANCHOLY, in medicine, a kind of delirium, attended with gloomy thoughts, heavineſs and ſorrow, without any apparent cauſe; ariſing from an exceſſive congeſtion of blood in the brain. This dreadful diſeaſe is nearly allied to madneſs, and only differs from it in degree. See the article MADNESS.

MELANE, among phyſicians. See the article ALPHOS.

MELANTERIA, in natural hiſtory, a very beautiful foſſil of a denſe, compact, and regular texture, and of an extremely bright pale-yellow, reſembling nothing ſo much as the pureſt gold: it is remarkably heavy, and is uſually found in little irregular maſſes of the bigneſs of a pigeon's egg, which are broken with a ſlight blow: but it is uſually met with in the form of a fine gold-coloured efflorescence or vitriolic and pyritical bodies; or in looſe, ſhattery, and friable maſſes of a more duſky yellow, in which latter ſtate it ſo much reſembles a native ſulphur, that it is frequently miſtaken for one: however, it is not inflammable; but calcines in the fire to a greyiſh powder, which by burning longer changes to a deep and fine purple.

The Greeks uſed it externally, as a gentle eſcharotic and a ſtyptic: they made it an ingredient in their ointments for old ulcers, and uſed to ſprinkle the powder of it on freſh wounds to ſtop the hæmorrhage.

MELANTHIUM, in botany, a genus of the hexandria trigynia claſs of plants: the female flower of which has no cup, and is compoſed of five lanceolate petals: the fruit is an ovato-triangular capſule with three cells in each of which are contained ſeveral oblong, compreſſed, and membranaceous ſeeds.

MELANURUS, in ichthyology, a ſpecies of Sparus, variegated with a number of

longitudinal lines, and with a black spot on each side at the tail. See the article SPARUS.

MELASTOMA, in botany, a genus of the decandria digynia class of plants, the flower of which consists of five roundish petals; and its fruit is a roundish berry, with five cells, each containing a number of seeds.

MELAZZO, a town of Turky, in the Lesser Asia, situated on a bay of the Archipelago: east long 28°, north lat. 37° 20′.

MELCHITES, in church-history, the name given to the Syriac, Egyptian, and other Christians of the Levant. The Melchites, excepting some few points of little or no importance, which relate only to ceremonies and ecclesiastical discipline, are in every respect professed Greeks; but they are governed by a particular patriarch, who resides at Damas, and assumes the title of patriarch of Antioch. They celebrate mass in the Arabian language. The religious, among the Melchites, follow the rule of St. Basil, the common rule of all the greek monks. They have four fine convents, distant about a day's journey from Damas, and never go out of the cloister.

MELCHIZEDECHIANS, in church-history, a sect which arose about the beginning of the third century, and affirmed, that Melchisedech was not a man, but a heavenly power, superior to Jesus Christ: for Melchisedech, they said, was the intercessor and mediator of the angels, but Jesus Christ was so only for men, and his priesthood only a copy of that of Melchisedech. This heresy was revived in Egypt by one Hierax, who pretended that Melchisedech was the Holy Ghost. See HIERACITES.

MELCK, a town of Germany, in Lower Austria, situated on the Danube, forty-seven miles west of Vienna.

MELCOMB REGIS, a borough town of Dorsetshire, six miles south of Dorchester. It sends two members to parliament.

MELDERT, a town of the Austrian Netherlands, in the province of Brabant, eight miles south of Lovain.

MELDORP, a town of the circle of Lower Saxony, and dutchy of Holstein: east long. 8° 50′, north lat. 54° 40′.

MELEAGRIS, the TURKEY, in ornithology. See the article TURKEY.

MELES, the BADGER, in zoology, is ranked by Linnæus under the same genus with the civet-cat and ichneumon; in all which the fore-teeth are obtuse, and those of the upper jaw striated. They have likewise all a bag of secreted matter, situated near the anus. See the articles ICHNEUMON and ZIBETHICUS.

The badger is about the size of a small dog, with a short and thick body. Its fur is composed of bristly hairs, which being yellow towards the roots, of a blackish brown in the middle, and of a deeper yellow at the tips, give the creature an odd mixture of deep brown and pale yellow, which together form a kind of grey; whence the animal itself is called the grey, in many places. See plate CLXXI. fig. 2.

MELIA, the BEAD-TREE, in botany, belongs to the decandria-monogynia class of plants, the flower of which is composed of five long, patent, and lanceolated petals; the fruit is a soft, globose drupe, with a roundish nut, marked with furrows, and containing five cells, in each of which is an oblong kernel.

MELIA TERRA, in natural history, the same with melinum. See MELINUM.

MELIANTHUS, HONEY-FLOWER, in botany, a genus of the didynamia-polypetala class of plants, the flower of which consists of four petals; and its fruit is a capsule with four cells, each containing a roundish seed.

MELIAPOUR, a city on the coast of Coromandel in India, and the same with St. Thomas. See *St.* THOMAS.

MELICA, in botany, a genus of the triandria digynia class of plants, the flower of which is composed of two valves, not aristated, and containing a single seed.

It is frequent in woods, and is called by authors gramen avenaceum, or oat-grass.

MELICERES, in surgery, a kind of encysted tumours, so called when their contents are of the consistence of honey; but when this is of the consistence of paste, they are called atheromata. See the articles ATHEROMA and TUMOUR.

MELIDA, an island in the gulph of Venice, situated on the coast of Dalmatia, subject to the republic of Ragusa: east long 18° 30′, north lat. 42° 30′.

MELILOT, *melilotus*, is by Linnæus accounted a species of trifolium. See the article TRIFOLIUM.

Melilot is scarce ever given internally, but externally used it is a great emolli-

ent, reſolvent, and digeſtive. It is a good ingredient in cataplaſms and fomentations, and alſo in clyſters. It uſed to be an ingredient in the plaſter, employed in dreſſing bliſters; but it is now left out of that compoſition. The flowers are recommended by ſome in infuſion, as a remedy for the fluor albus.

MELINDA, the capital of the province of the ſame name, and of all the Portugueze ſettlements on the coaſt of Malabar, in Africa: eaſt long. 39°, ſouth lat. 3°.

MELINUM, in natural hiſtory, the name of an earth, famous in the earlieſt ages of painting, being the only white of the great painters of antiquity; and, according to Pliny's account, one of the three colours with which alone they performed all their works. It is a fine, white, marly earth, of a very compact texture, yet remarkably light; a ſort of texture which muſt render any earth fit for the painter's uſe, that is of a proper colour. It is frequently found forming a ſtratum in the earth, lying immediately under the vegetable mould. It is of a very ſmooth, but not gloſſy ſurface, is very ſoft to the touch, adheres firmly to the tongue, is eaſily broken between the fingers, and ſtains the ſkin in handling. It melts readily in the mouth, and is perfectly fine, leaving not the leaſt grittineſs between the teeth. Thrown into water, it makes a great bubbling and loud hiſſing noiſe, and moulders away into a fine powder. It does not ferment with acids, and ſuffers no change in the fire. Theſe are the characters by which the melinum of the antients is diſtinguiſhed from all the other white earths. It is ſtill found in the ſame place from whence the painters of old had it, which is that from whence it has its name, the iſland of Milo, called Melos by the Greeks, and is common in moſt of the adjacent iſlands. It has been of late tried here as a paint, and is found not to make ſo bright a white as the other ſubſtances now in uſe among the painters, but ſeems not liable, like them, to turn yellow; and if ſo, would be worth the conſideration of perſons in the colour trade, eſpecially as it may be had in any quantities for carriage.

MELISSA, BAUM, in botany, a genus of the didynamia gymnoſpermia claſs of plants, with a monopetalous ringent flower, the lower lip of which is divided into three ſegments, whereof the middle one is cordated: the ſeeds are four in number, and contained in the bottom of the cup. Baum is greatly eſteemed, among the common people, as good in diſorders of the head and ſtomach; but it is leſs regarded in the ſhops. It is moſt conveniently taken in infuſion by way of tea; the green herb is greatly better than the dry, which is contrary to the general rule in relation to other plants.

MELITENSIS TERRA, *earth of Malta*, in the materia medica, an earth of which there are two very different kinds, the one of the genus of the boles, the other of the marles. The latter is that known by medicinal authors under this name; the former is the Malta earth now in uſe: but both being brought from the ſame place, are confuſedly called by the ſame name. The malteſe marle, which is the terra melitenſis of medicinal authors, is a looſe, crumbly, and very light earth, of an unequal and irregular texture, and when expoſed to the weather, ſoon falls into fine ſoft powder; but when preſerved and dried, it becomes a looſe, light maſs, of a dirty white colour, with a greyiſh caſt: it is rough to the touch, adheres firmly to the tongue, is very eaſily crumbled to powder between the fingers, and ſtains the hands. Thrown into water it ſwells, and afterwards moulders away into a fine powder. It ferments very violently with acid menſtruums. Both kinds are found in great abundance in the iſland of Malta, and the latter has been much eſteemed as a remedy againſt the bites of venomous animals, but with how much juſtice we cannot ſay. The other has ſupplied its place in the germa ſhops, and is uſed there as a cordial, ſudorific, and aſtringent. See BOLE.

MELITITES, in natural hiſtory, an in durated clay, ſo called from its yellowiſh or honey-like colour. See LAPIS.

MELITTIS, in botany, a genus of th didynamia angioſpermia claſs of plants the upper lip of whoſe cup is emarginat ed; the upper lip of its flower is plan and the lower one crenated.

MELIUS INQUIRENDUM, in law, a wr that lies for a ſecond inquiry to be mad of what lands, &c. a man died ſeized when partiality is ſuſpected upon the wr diem clauſit, &c.

MELLE, a town in the circle of Weſtpha lia, in Germany, ten miles ſouth-eaſt Oſnaburg, ſubject to the elector of Colog

MEL

MELLER, a large lake of Sweden, on the north ſide of which ſtands the capital city of Stockholm: it is eighty miles long, and thirty broad.

MELLILA, a port-town on the coaſt of Barbary, in the province of Fez: weſt long. 3°, and north lat. 35° 50′.

MELNICK, a town of Bohemia, twenty miles north of Prague.

MELOCHIA, in botany, a genus of the monadelphia-pentandria claſs of plants, the flower of which conſiſts of five large petals, vertically cordated; and its fruit is a roundiſh capſule with five cells, in each of which is a ſingle roundiſh ſeed.

MELODY, in muſic, the agreeable effect of different ſounds, ranged and diſpoſed in ſucceſſion; ſo that melody is the effect of a ſingle voice or inſtrument, by which it is diſtinguiſhed from harmony. See the article HARMONY.

However, the term melody is chiefly applicable to the treble, this being chiefly diſtinguiſhed by its air.

MELOE, the OIL-BEETLE, in zoology, a genus of inſects, of the order of the coleoptera; the antennæ of which are ſlender and filiform; the exterior wings are dimidiated, and there are no interior ones. See INSECTS and SCARABÆUS.

MELON, *melo*, in botany, is accounted only a ſpecies of cucumber. See the article CUCUMBER.

Melon-ſeed is eſteemed cooling and diuretic; being poſſeſſed of the ſame virtues with the other cold ſeeds, as they are called; and together with them is uſed in emulſions, and in ſome ſhop-compoſitions.

MELOTHRIA, in botany, a genus of the triandria-monogynia claſs of plants, the corolla whereof is compoſed of a ſingle rotated petal; the tube is of the length of the cup, and every where grows to it; the limb is plane, and is divided into five very obtuſe ſegments, broadeſt towards the edge; the fruit is an oval, oblong body, divided within into three parts, and containing a number of oblong, compreſſed ſeeds.

In Canada, Virginia, and Jamaica, where this fruit commonly grows, it is pickled for the table.

MELTING-CONE, in aſſaying, is defined by Cramer to be a ſmall veſſel made of copper or braſs, of a conic figure, and of a nicely poliſhed ſurface within; the uſe of which is to receive melted metals, and ſerve for their precipitation, which is effected, when two bodies melted together, and yet not mixing perfectly with one another in the fuſion, ſeparate in the cooling into two ſtrata, on account of their different ſpecific gravity. See the article PRECIPITATION.

This precipitation might be made in the ſame veſſel in which the fuſion is performed; but then the melting-pot or crucible muſt be broken every time to get it out, whereas the conic ſhape, and poliſhed ſurface of this veſſel, makes it eaſily got out without any violence. The ſhape of this veſſel is alſo of another uſe in the operation; for, by means of it, the heavy matter, ſubſiding to a point, is formed into a perfect and ſeparate regulus, even where the whole quantity, as is very frequently the caſe, has been but very ſmall. When the quantity of the melted matter is great, it is common to uſe, inſtead of this cone, a large braſs or iron-mortar, or any other conveniently ſhaped braſs or iron-veſſel. It is neceſſary, when the cone is of braſs, to be cautious that it be not made too hot; for the brittleneſs of that metal, when hot, makes it eaſily break, on the ſtriking with any force on that occaſion, to make the melted maſs fall out.

Theſe, and all other moulds for the receiving melted metals, muſt always be well heated before the maſs is poured into them, leſt they ſhould have contracted a moiſture from the air, or have been wetted by accident; in which caſe the melted metal will be thrown out of them with great violence and danger. They ought alſo to be ſmeared over with tallow on their inſide, that the regulus may be the more eaſily taken out of them, and the ſurface of the mould not corroded by the melted maſs poured in. If a very large quantity of a metal is, however, to be received into them, and eſpecially, if any thing ſulphureous have place among it, this caution of tallowing the moulds does not prove ſufficient; for the large quantity of the maſs makes it continue hot ſo long, that this becomes but a ſlight defence to the ſurface of the mould. In this caſe the aſſayer has recourſe to a lute, reduced to a thin pap with water, which being applied in form of a very thin cruſt, all over the inſide of the cone, or mould, ſoon dries up indeed, but always preſerves the ſides of the veſſel from the coroſion of the maſs.

MEMBER, in architecture, denotes any part of a building; as, a frieze, corniche, or the like. This word is alſo

ſome-

ſometimes uſed for the moulding. See the article MOULDING.

MEMBER, in grammar, is applied to the parts of a period or ſentence. See the articles PERIOD, SENTENCE, &c.

MEMBER *of parliament*. See the article PARLIAMENT.

MEMBERS, in anatomy, the exterior parts ariſing from the trunk or body of an animal.

MEMBERED, or MEMBRED, in heraldry, is where the legs or feet of an eagle, griffin, or other bird, are of a different colour from the reſt of the body.

MEMBRANE, in anatomy, a pliable texture of fibres, interwoven together in the ſame plane.

The membranes differ in thickneſs, according to the ſmalneſs of their fibres, or the number of their planes. Theſe particular planes are termed laminæ, and are diſtinguiſhed into internal, external, and middle. The difference of membranes, in general, depends on that of the fibres of which they are compoſed. Small portions of membranes, eſpecially when they are very thin, are called pellicles; and ſome membranaceous laminæ are united together by the intervention of a particular ſubſtance, compoſed of this ſort of pellicles, and called the cellular or ſpungy ſubſtance.

The membranes of the body are various, and variouſly denominated: ſuch are the peritonæum, pericardium, pleura, &c. Thoſe which ſerve as integuments, or covers of veſſels, are called tunics or coats; and thoſe which cover the brain, are called meninges. The muſcles too are each encloſed in a peculiar membrane.

The uſe of the membranes is to cover and wrap up the parts, and ſtrengthen them; to ſave them from external injuries; to preſerve the natural heat; to join one part to another; to ſuſtain ſmall veſſels, and the nerves which run thro' their duplicatures; to ſtop the returning of the humours in their veſſels, as the valves ſtop the returning of the blood in the veins and heart; of the chyle in the thoracic-duct, and of the lympha in the lymphatic veſſels.

MEMBRANOSUS, in anatomy, a muſcle otherwiſe called faſcia lata. See the article FASCIA.

MEMBRED, or MEMBERED, in heraldry. See the article MEMBERED.

MEMBRILLO, a town of Spain, fourteen miles ſouth of Alcantara.

MEMECYLON, in botany, a genus of the octandria-monogynia claſs of plants, the flower of which conſiſts of four petals, and its fruit is a berry.

MEMEL, a port-town of Poland, ſeventy miles north of Koningſberg: eaſt long. 21° 30′, north lat. 56°.

MEMMINGEN, a city of Germany, 25 miles ſouth of Ulm.

MEMOIRS, in matters of literature, a ſpecies of hiſtory, written by perſons who had ſome ſhare in the tranſactions they relate; anſwering to what the Romans called commentarii, commentaries.

The journals of the proceedings of a literary ſociety, or a collection of matters tranſacted therein, are likewiſe called memoirs.

MEMORY, *memoria*, a faculty of the human mind, whereby it retains or keeps the ideas it has once perceived. See the article IDEA.

Memory, ſays Mr. Locke, is, as it were, the ſtore-houſe of our ideas; for the narrow mind of man not being capable of having many ideas under view at once, it was neceſſary to have a repoſitory in which to lay up thoſe ideas which it may afterwards have uſe of. But our ideas being nothing but actual perceptions in the mind, which ceaſe to be any thing when there is no perception of them; this laying up of our ideas in the repoſitory of the memory, ſignifies no more but this; that the mind has a power, in many caſes, to revive perceptions it has once had, with this additional perception annexed to them, that it has had them before. And it is by the aſſiſtance of this faculty, that we are ſaid to have all thoſe ideas in our underſtandings which we can bring in ſight, and make the objects of our thoughts, without the help of thoſe ſenſible qualities which firſt imprinted them there.

Attention and repetition help much to the fixing ideas in our memories: but thoſe which make the deepeſt and moſt laſting impreſſions, are thoſe which are accompanied with pleaſure and pain. Ideas but once taken in and never again repeated, are ſoon loſt; as thoſe of colours in ſuch as loſt their ſight when very young.

The memory of ſome men is tenacious even to a miracle: but yet there ſeems to be a conſtant decay of all our ideas, even of thoſe which are ſtruck deepeſt, and in minds the moſt retentive: ſo that if they be not ſometimes renewed, the

print wears out, and at at laſt there remains nothing to be ſeen.

Thoſe ideas that are often refreſhed by a frequent return of the objects or actions that produce them, fix themſelves beſt in the memory, and remain longeſt there: ſuch are the original qualities of bodies, *viz.* ſolidity, extenſion, figure, motion, *&c.* and thoſe that almoſt conſtantly affect us, as heat and cold.

In memory, the mind is oftentimes more than barely paſſive; for it often ſets itſelf on work to ſearch ſome hidden ideas; ſometimes they ſtart of their own accord; and ſometimes tempeſtuous paſſions tumble them out of their cells. This faculty other animals ſeem to have to a great degree, as well as men, as appears by birds learning of tunes, and their endeavour to hit the notes right. For it ſeems impoſſible that they ſhould endeavour to conform their voices (as it is plain they do) to notes whereof they have no idea.

Defect of MEMORY, is a misfortune which may proceed from falls, contuſions, paſſions of the mind, *&c.* If the memory is much impaired, without any external cauſe, it is a fore-runner of an apoplexy, and if it proceeds from malignant acute diſeaſes, or poiſons, it is incurable.

When the cure is judged practicable, Heiſter recommends a moderate and ſtrengthening diet, together with carminative, aromatic, cephalic, and ſtomachic medicines. Spirit of lavender, hungary-water, Hoffman's balſam of life, and ſal volatile oleoſum, are alſo proper, uſed either internally or externally; likewiſe oil of cinnamon with ſugar, native cinnabar, or cinnabar of antimony; but being hot medicines, they ſhould be uſed with caution. Externally, oil of myrrh ſhould be applied to the temples, and vertex. Cubebs are deemed ſpecific; but young people ought to uſe them with caution. In old perſons, amber ſhould be mixed with the other medicines.

Local MEMORY, among orators, is nothing but the aſſociating the different heads to be handled, with the objects before the ſpeaker's eyes; ſo that by only looking around him, he is put in mind of what he is to ſay.

Artificial MEMORY, *memoria technica*, a method of aſſiſting the memory, by forming certain words, the letters of which ſhall ſignify the date or æra to be remembered. In order to this, the following ſeries of vowels, diphthongs, and conſonants, together with their correſponding numbers, muſt be exactly learned; ſo as to be able at pleaſure to form a technical word, that ſhall ſtand for any number, or to reſolve ſuch a word already formed.

a	*e*	*i*	*o*	*u*	*au*	*oi*	*ei*	*ou*	*y*
1	2	3	4	5	6	7	8	9	0
b	*d*	*t*	*f*	*l*	*s*	*p*	*k*	*n*	*z*

The firſt five vowels, in order, naturally repreſent 1, 2, 3, 4, 5; the diphthong *au* = 6, as being compoſed of *a* and *u*, or 1 + 5 = 6; and for the like reaſon, *oi* = 7, and *ou* = 9. The diphthong *ei* will eaſily be remembered for 8, as being the initials of the word. In like manner, where the initial conſonants could conveniently be retained, they are made uſe of to ſignify the number, as *t* for 3, *f* for 4, *s* for 6, and *n* for 9. The reſt were aſſigned without any particular reaſon, unleſs that poſſibly *p* may be more eaſily remembered for 7 or ſeptem, *k* for 8, or ὀκτω, *d* for 2, or duo; *b* for 1, as being the firſt conſonant, and *l* for 5, being the roman letter for 50, than any others that could have been put in their places.

It is farther to be obſerved, that *z* and *y* being made uſe of to repreſent the cypher, where many cyphers meet together, as 1000, 1000000, *&c.* inſtead of a repetition of *a z y z y z y*, &c. let *g* ſtand for 100, *th* for a thouſand, and *m* for a million. Thus *ag* will be 100, *ig* 300; *oug* 900, *&c. ath* 1000, *am* 1000000, *loum* 59000000. *&c.*

Fractions may be ſet down in the following manner: let *r* ſignify the line ſeparating the numerator and denominator, the firſt coming *before*, the other *after* it; as *iro* $\frac{3}{4}$, *urp* $\frac{5}{7}$, *pourag* $\frac{79}{100}$, *&c.* When the numerator is 1 or unit, it need not be expreſſed, but begin the fraction with *r*; as *re* $\frac{1}{2}$, *ri* $\frac{1}{3}$, *ro* $\frac{1}{4}$, *&c.* So in decimals, *rag* $\frac{1}{100}$, *rath* $\frac{1}{1000}$.

This is the principal part of the method, which conſiſts in expreſſing numbers by artificial words. The application to hiſtory and chronology is alſo performed by artificial words. The art herein conſiſts in making ſuch a change in the ending of the name of a place, perſon, planet, coin, *&c.* without altering the beginning of it, as ſhall readily ſuggeſt the thing ſought, at the ſame time that the beginning of the word, being preſerved, ſhall be a leading or prompting

ſyllable

ſyllable to the ending of it ſo changed. Thus, in order to remember the years in which Cyrus, Alexander, and Julius Cæſar, founded their reſpective monarchies, the following words may be formed; for Cyrus, Cyr*uts*; for Alexander, Alex*ita*; for Julius Cæſar, Juli*os*. *Uts* ſignifies, according to the powers aſſigned to the letters beforementioned, 536; *ita* is 331, and *os* is 46. Hence it will be eaſy to remember, that the empire of Cyrus was founded 536 years before Chriſt, that of Alexander, 331, and that of Julius Cæſar 46. This account is taken from a treatiſe, entitled, a New method of Artificial Memory; where the reader will find ſeveral examples in chronology, geography, *&c.* of ſuch artificial words diſpoſed in verſes, which muſt be allowed to contribute much to the aſſiſtance of the memory, ſince being once learned, they are ſeldom or never forgot. However, the author adviſes his reader to form the words and verſes himſelf, in the manner deſcribed above, as he will probably remember theſe better than thoſe formed by another.

Be this as it will, we ſhall here give his table of the kings of England ſince the conqueſt; where one thouſand being added to the italics in each word, expreſſes the year when they began their reigns. Thus,

Will-con*ſau*, Ruf*koi*, Hen*rag*

Steph*bil* & Henſec*huf*, Rich*bein*, J*ann*, Heth*das* & Ed*doid*.

Edſe*typ*, Edter*tep*, Riſe*tois*, Hefo*toun*, Hefi*ſad*que.

Henſi*fed*, Edquar*fauz*, Efi Ro*kt*, Henſep*feil*, Heno*clyn*.

Edſex*los*, Mary*lut*, Els*luk*, Jam*ſyd*, Caroprim*ſel*.

Carſec*ſok*, Jam*ſeif*, Wil*ſeik*, An*pyd*, Geo*bo-doi*.

MEMPHIS, once the capital of Egypt, ſtood on the weſt ſide of the Nile, almoſt oppoſite to Grand Cairo.

MENAN, a great river of the further India, which riſing north of Siam, runs through that kingdom, and falls into a bay of the Indian ocean below Bancock.

MENCHOU, a town of France, in the province of Champaign, ſixteen miles north-eaſt of Chalons.

MENDELSHAM, a market-town of Suffo'k, ſixteen miles eaſt of Bury.

MENDICANTS, or begging fryars, ſeveral orders of religious in popiſh countries, who having no ſettled revenues, are ſupported by the charitable contributions they receive from others. This ſort of fryars began in the thirteenth century; when the Waldenſes making a profeſſion of renouncing their eſtates, and leading a life of poverty, gave riſe to this inſtitution. Two of that ſect, Bernard and Durand, ſet up a congregation called the poor catholics: thoſe who afterwards followed their example are, the dominicans, franciſcans, auguſtins and carmelites.

MENDIP, a name given to ſeveral hills near the city of Wells, in Somerſetſhire, in which are lead mines.

MENGRELIA, a province of aſiatic Turky, ſituated on the north-eaſt part of the Euxine ſea, between Georgia and Circaſſia, where the Turks purchaſe boys and young women for their ſeraglios.

MENIALS, in law books, domeſtic or houſhold-ſervants, who live under their lord or maſter's roof.

MENIN, a little fortified town in Flanders, eight miles north of Liſle.

MENINGES, or MENYNGES, in anatomy, a name given to the dura and pia mater of the brain. See the article DURA MATER, *&c.*

MENIPPEAN, in poetry, a kind of ſatyr, conſiſting of proſe and verſe intermixed.

MENISCUS, in optics, a lens convex on one ſide, and concave on the other. See the article LENS.

For finding the focus of a meniſcus, the rule is: as the difference of the ſemidiameters of the concavity and convexity, to the ſemidiameter of the concavity; ſo is the diameter of ths convexity to the focal diſtance.

MENISPERMUM, VIRGINIAN IVY, in botany, a genus of the hexandria-trigynia claſs of plants, the corolla whereof conſiſts of ſix ovato-oblong, obtuſe, hollow, erecto-patent petals; the fruit is compoſed of three oval berries, each containing a ſingle cell, and in it a large ſingle, lunated, compreſſed ſeed.

It is to be obſerved, that the parts of fructification vary extremely in this genus.

MENNONITES, a ſect of baptiſts in Holland, ſo called from Mennon Simonis of Friezeland, who lived in the ſixteenth century. This ſect believe, that the New Teſtament is the only rule of faith; that the terms Perſon and Trinity are not to be uſed in ſpeaking of the Father, Son, and Holy Ghoſt; that the firſt man was not created perfect; that it is unlawful to ſwear or to wage war upon any occaſion; that infants are not the proper ſubjects of ba

baptiſm; and, that miniſters of the goſpel ought to receive no ſalary. They all unite in pleading for toleration in religion, and debar none from their aſſemblies who lead pious lives, and own the ſcriptures for the word of God. The mennonites meet privately, and every one in the aſſembly has the liberty to ſpeak, to expound the ſcriptures, to pray and ſing. They aſſemble twice every year, from all parts of Holland, at Rynſbourg, a village about two leagues from Leyden, at which time they receive the communion, ſitting at a table, where the firſt diſtributes to the reſt; and all ſects are admitted, even the roman catholics if they pleaſe to come.

MENOLOGY, the greek calendar, in which the lives of the ſaints in ſhort, or barely their names, are cited; anſwering nearly to the martyrology of the latin church. See MARTYROLOGY.

MENSA, in law-books, a term that includes in it all patrimony, and neceſſaries for livelihood.

MENSALS, *menſalia*, in church-hiſtory, ſuch livings as were formerly united to the tables of religious houſes, and hence called menſal benefices. See BENEFICE.

MENSES, FLOURS, COURSES, *catamenia*, in medicine, the monthly evacuations from the uterus of women not with child and not giving ſuck.

Among the natural actions which prepare proper juices and matter for carrying on the vital motions, may be reckoned this menſtrual purgation of women, ſince by means thereof the ſuperfluous and redundant blood is evacuated, that what remains in the veins may circulate with greater freedom, and be the more effectually depurated. This evacuation is occaſioned by the redundance of that fluid in women and the peculiar ſtructure of the uterus; and as it is of great importance to health, ſo it is the means by which the fœtus is nouriſhed. The antient phyſicians, and the generality of the modern ones, aſcribe the periodical return of this flux to the influence of the moon, or to the lunar phaſes. The quantity of blood thus evacuated cannot be exactly and accurately aſcertained, for it varies in women of different ages, methods of life, and conſtitutions. About the firſt eruption of the menſes the quantity diſcharged is generally but ſmall. Lean women, and thoſe who abound in blood, evacuate more than ſuch as are fat and of a cold conſtitution; and thoſe who are addicted to luxury and idleneſs, a larger quantity than thoſe who live upon low and ſlender diet, or uſe much exerciſe. The menſtrual blood is ſaid to be evacuated both from the minute veſſels of the uterus and vagina; it is, however, a great controverſy among anatomiſts, whether this blood is diſcharged from the veins of the uterus alone, or thoſe of the vagina, excluſive of the uterus. The menſes generally make their firſt eruption in girls about fourteen years of age, and ceaſe between forty and fifty. When this evacuation begins, the body is frequently freed from numberleſs diſorders ariſing from the redundance of ſerum before generated; and when it ceaſes, a large number of diſorders are generally produced.

Immoderate flux of the MENSES. Every large flux of blood from the uterus is not to be eſteemed noxious, but ſuch only as is attended with loſs of ſtrength, which brings on other ſymptoms, ſuch as want of appetite, crudities from indigeſtion, a ſenſation of weight near the region of the ſtomach, an ill colour in the face, a languid pulſe, often with a gentle heat, an œdematous ſmelling of the feet, and a diſturbed ſleep without refreſhment. Sometimes the menſes flow in too great plenty and with impetuoſity at the uſual period; ſometimes twice or oftener in a month; ſometimes again they continue ſeveral days longer than ordinary. This flux ſometimes conſiſts of thin florid blood, which happens chiefly in abortions and from a retention of pieces of the ſecundines, which keep the mouths of the veſſels open; ſometimes there are coagulated and clotted maſſes, like fleſh which come away with the blood, of the ſize of an egg, which is occaſioned by a ſtoppage of the menſes for two or three months. At other times the blood is grumous, coagulated and black, generally on the firſt days of childbed, in ſlender and plethoric ſubjects. When the patient is cachectic, and the flux continues long, it is then watry and mucid; in ſcorbutic perſons it is watry and fetid, with acrimony and pain, in the younger ſort, before child-bearing; if the evacuation be immoderate, it is commonly followed by a fluor albus.

The cauſe may be referred to a copious and impetuous afflux of the blood to the uterus, and an unequal and impeded reflux by the veins, which diſtending and relaxing the uterine veſſels, make the ori-

fices too wide, or rend and corrode them, by which the blood flows too freely: this may happen from a plethora, or when there has been a long ſuppreſſion, or an abortion, or a difficult labour. It generally happens to women about the fiftieth year, when the menſes are going to leave them, and not always without danger. If the body is cacochymic, or ſcorbutic, or full of bad humours, or afflicted with the venereal diſeaſe, the caſe is dangerous and troubleſome. It is produced by a ſedentary life, by too frequent an uſe of ſalt, acrid and ſeaſoned meats, by ſpirituous liquors, by violent agitations and paſſions of the mind, from loſſes, love, anger, &c.

The cure, according to Aſtruc, ſhould reſpect the reſtraining a preſent flux. It ſhould begin with reſt if convenient, in bed; the patient lying on her back and kept as ſilent as poſſible: ſhe ſhould be bled in the arm in proportion as her conſtitution, ſtrength and the urgency of the ſymptoms will admit. Let her fare ſtenderly on veal and chicken-broth, fiſh-ſoops, and drink a ptiſan of nettle-tops, yarrow and plantane, with orange peel, or of the greater comfrey; if the patient is hot and bilous, with linſeed. If theſe fail, let her take twenty-five or thirty grains of roch-alum in ſubſtance, with a draught of an aſtringent decoction. In more deſperate caſes the uterus may be ſyringed with a ſyringe made for that purpoſe, with a decoction of plantane, red roſes, and yarrow, with vinegar or powder of roch alum. If the menſes appear in breeding women, the true and only remedy is opium, which muſt be given freely till the intention is obtained.

Suppreſſion of the MENSES. Boerhaave obſerves, that in a ſuppreſſion of the menſes there is a plethora, with a liſtleſſneſs to motion, a heavineſs, a paleneſs, a pain of the loins and of the groin; all the functions, whether natural, vital, or animal, are depraved; ſometimes the menſes will force a way through the eyes, ears, noſtrils, gums, the ſalival ducts, the œſophagus, from the alvus, bladder, breaſts, ſkin, wounds or ulcers. Hence often ariſes a depravation of all the viſcera, as alſo diſeaſes without number, partly from a putrefaction already begun, and partly from the hurt which the veſſels have received.

From this diſorder, Aſtruc obſerves, proceed want of appetite, the pica malacia, or a depraved appetite. If it is habitual and obſtinate, a ſchirrus or dropſy of the womb are to be feared, or a rupture of ſome blood-veſſel, eſpecially of the lungs. It is not ſo dangerous when the uterus is not infarcted, or when there is no other ſymptom of the menſes. If this diſeaſe is attended with the fluor albus, it may become habitual, and from yellow become green and acrid, corroding the uterus, and laying the foundation of a dropſy therein.

Things which retard the menſes are immoderate cold, ſorrow, a ſudden fright, too great evacuations, incraſſating diet, a crudity of the humours, acids, and aſtringent medicines.

This diſorder, according to Sydenham, is to be cured in the ſame manner as the hyſteric affection, but if the remedies for that fail, the patient muſt take every morning five ſpoonfuls of hyſteric julep with twelve drops of ſpirit of hartſhorn, and every night one ſcruple of powder of myrrh camphorated, made into a bolus or pills with the ſyrup of orange-peels. Allen recommends cantharides and camphor: the doſe is from two grains to five. Hoffman directs chalybeats, or pills made of aloes, myrrh, ſaffron, ambra, caſtor, and round birthwort. Pitcairn thinks mercury more efficacious than ſteel. If the fluids are inclinable to ſtagnate, their fluidity may be preſerved by fomentations and frictions of the feet, by opening a vein in the foot, and bleeding elſewhere, by giving uterine purges, by emmenagogues, by plaſters, fomentations, liniments, vapours and heat, by ſtrengthening the veſſels debilitated with a plethora by chalybeats and aſtringents. See the articles FOMENTATION, FRICTION, EMMENAGOGUES, LINIMENT, &c.

MENSTRUUM, in chemiſtry, any body which in a fluid or ſubtiliſed ſtate is capable of interpoſing its ſmall parts twixt the ſmall parts of other bodies, as to divide them ſubtily, and form a uniform compound of the two. Hence chemiſts have divided menſtruums into ſolid and fluid. Dry or ſolid menſtruums may again be divided into five claſſes, which, according to Boerhaave, are as follow. 1. The fix metals, gold, lead, ſilver, copper, iron and tin, which act upon one another after being fuſed in the fire, and may be intimately mixed, ſo as to make an apparently homogeneous maſs, every particle of which holds the ſame pro-

tion of a different metal as the whole. For if ten ounces of silver be thus mixed with an ounce of gold, and a grain of this mass be given to an assay-master, he will discover that it contains one eleventh part gold and ten parts silver. 2. The semi-metals, as antimony, bismuth, cinnabar, marcasites and zink, which, when melted, mix with one another or with metals; but when thus mixed they are no longer malleable, but may easily be reduced to powder. 3. The dry salts, as alum, borax, nitre, sal-ammoniac, sea-salt, vitriol, fixed alkali, and mercury-sublimate, which may be subtily divided by fire, and intimately mix with one another, with metals, semi-metals, and other things. 4. Hard fossil sulphureous bodies, as sulphur vivum, common brimstone, arsenic, orpiment and cobalt. 5. The fossil bodies, called by refiners cements, which consist of salts, sulphur and brick reduced to dry powders and strowed betwixt plates of metals, in order to raise their colour, or separate one metal from another.

Some menstruums being left to themselves, after solution concrete into an hard mass, which, though compounded, appears of an uniform simple nature. In this manner, if melted lead be mixed with tin, they unite, as water with water, or mercury with mercury. The case is the same in all the metals, and in some of the semi-metals. Thus if a scruple of regulus of antimony be added to a pound of melted tin, the mass when cold will appear uniform, but become entirely brittle: so fixed alkali unites with sand in the fire; and sulphur and mercury, by being ground together, turn to a black and dry powder, which being sublimed produces an apparent simple body called cinnabar. Many become an hard, and sometimes a dry body. Thus almost all the menstruums of metals unite with their respective metals into solid vitriols: and thus strong distilled vinegar, when it has dissolved shells, chalk, and stony substances, separates from its water, and together with the body it dissolves, forms a dry hard mass. See SOLUTION.

Numerous menstruums have a liquid form before they act as solvents; as vinegar, water, saline, acid, alcaline and compounded spirits, alcaline oils per deliquium, &c. some menstruums become liquid after the solution, and continue so with the solvent. Thus in the dissolution of five of the metals with simple mercury a soft paste is produced, which may indefinitely be diluted by the addition of more mercury, but there is scarcely any known method of restoring this amalgama to its solidity. All the liquid menstruums, after having dissolved metals in a large proportion, cannot easily be dried; whence many have imagined these solutions to be fixed metallic oils, and in vain sought secrets in them.

It is now easy to observe that many menstruums unite bodies as well as separate them; for frequently after the dissolution the particles of the menstruum presently join with those of the solvent, and produce a new compound, often very different from the nature of the simple resolved body. The parts however of the solvent, after its concretion, no longer touch one another, but are separated by the interposition of the particles of the matter dissolved. And the particles which before constituted the solvend are separated by the interposition of the particles of the solvent. Hence it is plain that the parts of the menstruums apply themselves to the parts of the solvend; and a certain cause is here required to make the particles of the solvent fly from one another and approach the particles of the solvend, rather than remain in their former situation. The like cause seems to be required to make the particles of the solvend, now separated, remain united with the parts of the menstruum, rather than suffer the dissolving and dissolved particles to unite by their natural affinity into homogeneous bodies. This cause must be sought in the solvend as well as in the solvent, for the action is reciprocal. Thus while aqua regia dissolves thrice its weight of gold into a yellow liquor, the particles of gold are united with the aqua regia, and remain suspended in it, though gold be eighteen times heavier than aqua regia. Whence there must be a mutual corresponding power between the particles of the gold and aqua regia, whereby they act upon, embrace and detain each other, otherwise the particles of gold would fall to the bottom, the saline particles rest upon them, and the water float over both. If we were to deduce the cause from similitude of substance, the action of dissolution seems to be performed by a certain power of the parts of the menstruum to attract the dissolved parts rather than to repel them; and is not a me-

chanical action, or unfriendly commotion, but rather an appetite of union. Thus, in a violent ſolution, the agitation, heat, hiſſing and tumult ceaſe when all the parts of the ſolvend have united with thoſe of the ſolvent, as appears in throwing a piece of iron into weak aqua fortis.

The whole ſolvent never acts at once on the whole ſolvend, only thoſe particles of the ſolvend which touch ſome others of the ſolvent act firſt; and theſe being ſeparated, freſh particles of the menſtruum apply themſelves to others of the ſolvend: therefore part of the menſtruum acts upon that part of the body which it ſtrikes off and ſeparates, but the conflict made in this ſeparation excites a greater motion in the menſtruum, by which means other parts of the menſtruums are agitated and applied to other parts of the ſolvend.

Fire excites, promotes, and increaſes the action of menſtruums; for in extreme cold, ſolutions are either not made or made but ſlowly, but they are ſoon performed by the aſſiſtance of heat: ſome menſtruums require a ſtrong heat, as mercury, before it will diſſolve metals: ſome a ſmaller; thus ſal armoniac, ſea ſalt, and ſalt of tartar eaſily diſſolve in water: ſome menſtruums act with a moderate heat, but loſe their diſſolving power, or even acquire a power of coagulating, by a ſtronger; thus warm water diſſolves the white of eggs, which boiling water coagulates. This effect of fire ſeems to be produced, 1. by impelling, moving and agitating the menſtruum in the manner of a mere mechanical motion. 2. By its general power of expanding the ſubſtance of all bodies. 3. By ſeparating the parts ſo as to ſet them farther aſunder. In moſt caſes the heat is increaſed during the ſolution, and even the action of thoſe menſtruums is augmented by heat, which generate a great degree of cold in the ſolution; thus ſal ammoniac diſſolves ſooneſt in warm water.

The above being part of the doctrine of Boerhaave concerning menſtruums, we ſhall ſubjoin the following axioms and canons in relation to the ſame ſubject from Dr. Shaw's chemical lectures.

That author having derived theſe axioms from experiments, thence deduces the canons in the manner following. 1. That water is a menſtruum which of itſelf diſſolves little more than ſalts, but being aſſiſted by acids, diſſolves earths, and even metals themſelves. See the article ACID *menſtruums*.

Hence a general rule of practice might be drawn for making water an almoſt univerſal menſtruum; thus, by the addition of a fixed alkaline ſalt, it diſſolves oil into a ſoap; by the addition of alcohol, it extracts the reſinous tinctures of vegetables; and in this manner it might be proper to run through the different ſubjects of the vegetable, animal and mineral kingdoms, and form tables of the ſolutive powers of water, ſeparate, and in conjunction. 2. That ſuch tables may be readily formed of the diſſolving power of all known menſtruums, to ſhew, by inſpection, in what time, in what proportion, and with what degree of heat all ſolvents perform their actions; which being once reduced to a certainty, would greatly facilitate and improve the practice of chemiſtry. 3. That the power of alcohol, as a menſtruum, is chiefly limited to reſins and oils, but by certain additions may be extended, as was ſaid of water, ſo as to become an almoſt univerſal ſolvent. Thus, by the addition of water, it becomes brandy, or ſpirit which extracts many tinctures that pure water and pure alcohol will not ſeparately extract. Whence we have a good inſtruction for attempting a new ſet of menſtruums by mixture, or the compoſition of two or three ſimple ſolvents: and if the requiſite care and ſkill were employed in this matter, many uſeful diſcoveries might be juſtly expected from it. Indeed the mixing of two menſtruums may ſometimes deſtroy the virtue of both: thus ſpirit of nitre and ſimple water will each of them ſeparately diſſolve the calculus humanus, but not touch it when they are mixed: but this inſtance is only particular, and there are a large number procible on the contrary ſide, which may tionally recommend a further proſecut of this enquiry. 4. That metals are luble in oils and acid ſpirits, ſo as not be eaſily diſcovered therein: whence rule may be drawn for a prudent ſuſpenſion of the judgment, and a ratio diſtruſt of the ſenſes, in chemical operations; and again, a caution deri againſt being impoſed on by vain prete of alchymiſts. 5. That the power menſtruum is not to be judged of by innocency with regard to the ani body: the acid ſpirit of bread is in cent and wholeſome, yet capable of ſolving coral and gems. Pure oil-

will diſſolve lead and tin. The white of an egg boiled hard, and ſuffered to run *per deliquium*, diſſolves the tough body of myrrh. 6. That the action of menſtruums depends upon a certain ſecret and reciprocal relation betwixt the ſolvent and ſolvend, ſcarce cognizable by the direct ſenſes, nor hitherto well made out by inſtances and induction. 7. That menſtruums have not their full action unleſs reduced to a fluid or ſubtile ſtate. Water in the firm and ſolid form of ice, does not act on ſalts, but they ſoon begin to diſſolve each other upon contact. Metals do not act upon metals in the way of ſolution till they are fuſed; nor does ſulphur diſſolve quickſilver till they are both reduced either to a fluid or very ſubtile ſtate by triture or melting; whence to promote the actions of menſtruums, we are directed to reduce both the ſolvent and ſolvend to minute parts, or the neareſt poſſible to a fluid ſtate, whether by heat, triture, fuſion, or otherwiſe. 8. That quickſilver is a true ſolvent of metals, ſo as to drink them in as water drinks in ſalts; by which means one metal may be readily united with another in any proportion by ſimple triture; and by this means, amalgamation and many operations in the ſublimer metallurgy are performed. 9. That acid ſpirits are not equally proper menſtruums to all the metals: thus ſpirit of nitre, though it diſſolves the reſt, will not diſſolve gold. 10. That all bodies in nature may become menſtruums to one another, each of them being, by ſome means or other, capable of having their parts uniformly interpoſed betwixt the ſmall parts of any of the reſt; thus even metals may, by art, be made to diſſolve in water, as we evidently ſee from numerous ſolutions of metals in acid ſpirits: theſe ſpirits being no more than water charged with the fine or more volatile parts of ſalts. 11. That the cauſe commonly aſſigned of ſolution, *viz.* the admiſſion of the fine particles of one body into the pores of another, whoſe figure fits them for their reception, is not juſt or adequate, but hypothetical and ill preſumed; ſince we find that ſome bodies will uniformly diſſolve their own quantity of others, as water does of Epſom-ſalt, alcohol of eſſential oils, mercury of metals, one metal of another, *&c.* whereas the ſum of the pores or vacuities of every body, muſt be neceſſarily leſs than the body itſelf, and conſequently thoſe pores cannot receive a quantity of matter equal to the body wherein they reſide. 12. That the diſſolving power of water may be immenſely increaſed by means of the digeſtor, from which inſtrument there are ſolid grounds of hope that it may, under a proper regulation, greatly contribute to the improvement of chemiſtry, natural philoſophy, and arts. See the article DIGESTOR.

13. Upon the whole, it ſhould ſeem that many deſireable improvements are derivable to arts from an improvement in the buſineſs of menſtruums. The diſcovery of that common menſtruum aqua fortis, introduced the art of aſſaying, and the ſcarlet-dye. That of alcohol introduced the arts of varniſhing and japaning. Numerous pigments for painters, colours for dyers, tan-liquors for tanners, the ſtaining of bone, horn, ivory, marble, various kinds of ink, tinctures, and ſolutions in medicine, chemiſtry, and other arts, have all reſulted from the diſcovery of menſtruums; yet this ſubject ſeems almoſt as new and rich as ever, ſo that numerous other diſcoveries of the ſame kind could not exhauſt it.

Univerſal MENSTRUUM. See the article ALKAHEST.

MENSURATION, in general, denotes the act or art of meaſuring lines, ſuperficies, or ſolids. See DISTANCE, GAUGING, HEIGHT, SURVEYING, *&c.*

MENTHA, MINT, in botany. See the article MINT.

MENTZ, the capital of one of the electorates of the ſame name in Germany, ſituated at the confluence of the rivers Rhine and Maine: eaſt long. 8°, and north lat. 50°.

MENTZELIA, in botany, a genus of the polyandria-monogynia claſs of plants, the flower of which conſiſts of five patent petals: the fruit is an oblong, unilocular capſule, containing a number of ſmall roundiſh ſeeds.

MENYANTHES, BUCKBEAN, in botany, a genus of the pentandria-monogynia claſs of plants, with a monopetalous funnel-like flower, divided into five deep ſegments at the limb: the fruit is an oval capſule with one cell, containing a great many ſmall ſeeds.

Buckbean, called by authors trifolium paluſtre and paludoſum, and by Tournefort nymphoides, is greatly recommended as a diuretic, in dropſical caſes; as alſo in the cure of intermittent fevers, and diſorders of the breaſt ariſing from tough

tough matter in the lungs: the general way of taking it is in a ſtrong infuſion, though many prefer the juice freſh expreſſed from the leaves.

MEOTIS, or PALUS MEOTIS, a ſea of Turky, which divides Europe from Aſia, extending from C im Tartary to the mouth of the river Don, or Tanais.

MEPPEN, a city of Germany, in the circle of Weſtphalia, and biſhopric of Munſter: eaſt long. 7°, north lat. 52° 55′.

MEQUENENCA, a city of Spain, in the province of Arragon, fifty miles ſouth-eaſt of Saragoſſa.

MEQUINEZ, a city of Fez, in the empire of Morocco: weſt long. 6°, north lat. 34°.

MERAN, or MORAN, a city in the circle of Auſtria and county of Tyrol: eaſt long. 11° 15′, north lat. 46° 40′.

MERCATOR's SAILING, that performed by Mercator's chart. See the articles CHART and NAVIGATION.

MERCATOR's *projection of maps*. See the article MAP.

MERCHANT, a perſon who buys and ſells commodities in groſs, or deals in exchanges; or that traffics in the way of commerce, either by importation or exportation. Formerly every one who was a buyer or ſeller in the retail way, was called a merchant, as they are ſtill both in France and Holland; but here ſhopkeepers, or thoſe who attend fairs or markets, have loſt that appellation.

Previous to a perſon's engaging in a general trade, and becoming an univerſal dealer, he ought to treaſure up ſuch a fund of uſeful knowledge, as will enable him to carry it on with eaſe to himſelf, and without riſking ſuch loſſes as great ill-concerted undertakings would naturally expoſe him to. A merchant ſhould therefore be acquainted with the following parts of commercial learning: 1. He ſhould write properly and correctly. 2. Underſtand all the rules of arithmetic that have any relation to commerce. 3. Know how to keep books of double and ſingle entry, as journals, a ledger, &c. 4. Be expert in the forms of invoices, accounts of ſales, policies of inſurance, charter-parties, bills of lading, and bills of exchange. 5. Know the agreement between the money, weights and meaſures of all parts. 6. If he deals in ſilk, woollen, linen, or hair manufactures, he ought to know the places where the different ſorts of merchandizes are manufactured, in what manner they are made, what are the materials of which they are compoſed, and from whence they come, the preparations of theſe materials before working up, and the places to which they are ſent after their fabrication. 7. He ought to know the lengths and breadths which ſilk, woollen, or hair-ſtuffs, linen, cottons, fuſtians, &c. ought to have according to the ſeveral ſtatutes and regulations of the places where they are manufactured, with their different prices, according to the times and ſeaſons; and if he can add to his knowledge the different dyes and ingredients which form the various colours, it will not be uſeleſs. 8. If he confines his trade to that of oils, wines, &c. he ought to inform himſelf particularly of the appearances of the ſucceeding crops, in order to regulate his diſpoſing of what he has on hand; and to learn as exactly as he can, what they have produced when got in, for his direction in making the neceſſary purchaſes and engagements. 9. He ought to be acquainted with the ſorts of merchandize found more in one country than another, thoſe which are ſcarce, their different ſpecies and qualities, and the propereſt method for bringing them to a good market, either by land or ſea. 10. To know which are the merchandizes permitted or prohibited, as well on entering as going out of the kingdoms or ſtates where they are made. 11. To be acquainted with the price of exchange, according to the courſe of different places, and what is the cauſe of its riſe and fall. 12. To know the cuſtoms due on importation or exportation of merchandizes, according to the uſage, the tarifs, and regulations of the places to which he trades. 13. To know the beſt manner of folding up, embaling, or tunning the merchandizes for their preſervation. 14. To underſtand the price and condition of freighting and inſuring ſhips and merchandize. 15. To be acquainted with the goodneſs and value of all neceſſaries for the conſtruction and repairs of ſhipping, the different manner of their building, what the wood, the maſts, cordage, cannons, ſails, and all requiſites may coſt. 16. To know the wages commonly given to the captains, officers, and ſailors, and the manner of engaging with them. 17. He ought to underſtand the foreign languages, or at leaſt as many of them as he can attain to; theſe may be reduced to four, viz. the Spaniſh

Spaniſh, which is uſed not only in Spain, but on the coaſt of Africa, from the Canaries to the Cape of Good Hope: the Italian, which is underſtood on all the coaſts of the Mediterranean, and in many parts of the Levant: the German, which is underſtood in almoſt all the northern countries; and the French, which is now become almoſt univerſally current. 18. He ought to be acquainted with the conſular juriſdiction, with the laws, cuſtoms, and uſages of the different countries he does or may trade to; and in general all the ordinances and regulations, both at home and abroad, that have any relation to commerce. 19. Though it is not neceſſary for a merchant to be very learned, it is proper that he ſhould know ſomething of hiſtory, particularly that of his own country, geography, hydrography, or the ſcience of navigation; and that he is acquainted with the diſcoveries of the countries in which trade is eſtabliſhed, in what manner it is ſettled, of the companies formed to ſupport thoſe eſtabliſhments, and of the colonies they have ſent out.

All theſe branches of knowledge are of great ſervice to a merchant who carries on an extenſive commerce; but if his trade and his views are more limited, his learning and knowledge may be ſo too: but a material requiſite for forming a merchant is, his having on all occaſions a ſtrict regard to truth, and his avoiding fraud and deceit as corroding cankers that muſt inevitably deſtroy his reputation and fortune.

Trade is a thing of ſo univerſal a nature, that it is impoſſible for the laws of England, or of any other nation, to determine all the affairs relating to it; therefore all nations, as well as Great Britain, ſhew a particular regard to the law merchant, which is a law made by the merchants among themſelves: however, merchants and other ſtrangers are ſubject to the laws of the country in which they reſide. Foreign merchants are to ſell their merchandize at the port where they land, in groſs, and not by retail; and they are allowed to be paid in gold or ſilver-bullion, in foreign coin or jewels, which may be exported. If a difference ariſes between the king and any foreign ſtate, the merchants of that ſtate are allowed ſix months time to ſell their effects and leave the kingdom, during which time they are to remain free and unmoleſted in their perſons and goods. See the articles COMMERCE and NAVAL AFFAIRS.

MERCURIAL, ſomething conſiſting of or relating to mercury. See MERCURY. The efficacy of mercurial medicines depends on the extreme fineneſs and great weight of their particles, whereby they penetrate into the inmoſt receſſes of the animal ſtructure, and there remove obſtructions. However, as they tend to quicken the circulation of the blood, their uſe in hectical caſes ſeems dangerous.

MERCURIALIS, MERCURY, in botany, a genus of the dioecia ennendria claſs of plants, with an apetalous flower, conſiſting only of ſtamina: the fruit is a large bilocular capſule, with a ſingle roundiſh ſeed in each cell.

MERCURIFICATION, in chemiſtry, the method of ſeparating the mercuries of metals, which is moſt eaſily effected by means of a burning-glaſs; for the metal being placed in its focus, its mercurial parts are ſaid to fly off in ſmoke, which when condenſed and collected, appears to be true quickſilver.

MERCURY, in natural hiſtory, a ſemimetal naturally fluid, and the heavieſt of all known bodies except gold: it is ſo perfectly homogeneous and ſimple in its nature, that it is a queſtion whether gold itſelf be more ſo: when perfectly purified, it appears the ſame in all its parts, as far as our utmoſt teſts can go, till we come to that ſevere trial, the ſolar fire. It penetrates the parts of all the other metals, renders them brittle, and in part diſſolves them. It is wholly volatile in the fire, and may be driven up in vapour by a degree of heat very little greater than that of boiling water. It is the leaſt tenacious of all known bodies, for its parts ſeparate into more minute ones of the ſame figure, with the ſmalleſt force. It is, indeed, the moſt diviſible of all bodies, for the vapour, in form of which it riſes in evaporation, is almoſt too thin to be diſtinguiſhed from the ambient air, yet this is pure unaltered mercury; for if it is received into cold water, it forms itſelf again into regular round drops. Notwithſtanding a ſmall heat ſerves to evaporate mercury, yet if it be kept in a degree ſmaller than that, in a veſſel carefully cloſed, a long continuance of that heat will reduce it to a red calx in form of powder, and this may be again revived into fluid mercury by a gentle heat given it in ſtratification with charcoal-duſt. If it be placed in its crude ſtate in the focus of a great burning-

glaſs,

chanical action, or unfriendly commotion, but rather an appetite of union. Thus, in a violent ſolution, the agitation, heat, hiſſing and tumult ceaſe when all the parts of the ſolvend have united with thoſe of the ſolvent, as appears in throwing a piece of iron into weak aqua fortis.

The whole ſolvent never acts at once on the whole ſolvend, only thoſe particles of the ſolvend which touch ſome others of the ſolvent act firſt; and theſe being ſeparated, freſh particles of the menſtruum apply themſelves to others of the ſolvend: therefore part of the menſtruum acts upon that part of the body which it ſtrikes off and ſeparates, but the conflict made in this ſeparation excites a greater motion in the menſtruum, by which means other parts of the menſtruums are agitated and applied to other parts of the ſolvend.

Fire excites, promotes, and increaſes the action of menſtruums; for in extreme cold, ſolutions are either not made or made but ſlowly, but they are ſoon performed by the aſſiſtance of heat: ſome menſtruums require a ſtrong heat, as mercury, before it will diſſolve metals: ſome a ſmaller; thus ſal armoniac, ſea ſalt, and ſalt of tartar eaſily diſſolve in water: ſome menſtruums act with a moderate heat, but loſe their diſſolving power, or even acquire a power of coagulating, by a ſtronger; thus warm water diſſolves the white of eggs, which boiling water coagulates. This effect of fire ſeems to be produced, 1. by impelling, moving and agitating the menſtruum in the manner of a mere mechanical motion. 2. By its general power of expanding the ſubſtance of all bodies. 3. By ſeparating the parts ſo as to ſet them farther aſunder. In moſt caſes the heat is increaſed during the ſolution, and even the action of thoſe menſtruums is augmented by heat, which generate a great degree of cold in the ſolution; thus ſal ammoniac diſſolves ſooneſt in warm water.

The above being part of the doctrine of Boerhaave concerning menſtruums, we ſhall ſubjoin the following axioms and canons in relation to the ſame ſubject from Dr. Shaw's chemical lectures.

That author having derived theſe axioms from experiments, thence deduces the canons in the manner following. 1. That water is a menſtruum which of itſelf diſſolves little more than ſalts, but being aſſiſted by acids, diſſolves earths, and even metals themſelves. See the article ACID *menſtruums*.

Hence a general rule of practice might be drawn for making water an almoſt univerſal menſtruum; thus, by the addition of a fixed alkaline ſalt, it diſſolves oil into a ſoap; by the addition of alcohol, it extracts the reſinous tinctures of vegetables; and in this manner it might be proper to run through the different ſubjects of the vegetable, animal and mineral kingdoms, and form tables of the ſolutive powers of water, ſeparate, and in conjunction. 2. That ſuch tables may be readily formed of the diſſolving power of all known menſtruums, to ſhew, by inſpection, in what time, in what proportion, and with what degree of heat all ſolvents perform their actions; which being once reduced to a certainty, would greatly facilitate and improve the practice of chemiſtry. 3. That the power of alcohol, as a menſtruum, is chiefly limited to reſins and oils, but by certain additions may be extended, as was ſaid of water, ſo as to become an almoſt univerſal ſolvent. Thus, by the addition of water, it becomes brandy, or ſpirit which extracts many tinctures that pure water and pure alcohol will not ſeparately extract. Whence we have a good inſtruction for attempting a new ſet of menſtruums by mixture, or the compoſition of two or three ſimple ſolvents: and if the requiſite care and ſkill were employed in this matter, many uſeful diſcoveries might be juſtly expected from it. Indeed the mixing of two menſtruums may ſometimes deſtroy the virtue of both: thus ſpirit of nitre and ſimlpe water will each of them ſeparately diſſolve the calculus humanus, but not touch it when they are mixed: but this inſtance is only particular, and there are a large number producible on the contrary ſide, which may rationally recommend a further proſecution of this enquiry. 4. That metals are ſoluble in oils and acid ſpirits, ſo as not to be eaſily diſcovered therein: whence a rule may be drawn for a prudent ſuſpenſion of the judgment, and a rational diſtruſt of the ſenſes, in chemical operations; and again, a caution derived againſt being impoſed on by vain pretences of alchymiſts. 5. That the power of a menſtruum is not to be judged of by its innocency with regard to the animal body: the acid ſpirit of bread is innocent and wholeſome, yet capable of diſſolving coral and gems. Pure oil-olive will

will diſſolve lead and tin. The white of an egg boiled hard, and ſuffered to run *per deliquium*, diſſolves the tough body of myrrh. 6. That the action of menſtruums depends upon a certain ſecret and reciprocal relation betwixt the ſolvent and ſolvend, ſcarce cognizable by the direct ſenſes, nor hitherto well made out by inſtances and induction. 7. That menſtruums have not their full action unleſs reduced to a fluid or ſubtile ſtate. Water in the firm and ſolid form of ice, does not act on ſalts, but they ſoon begin to diſſolve each other upon contact. Metals do not act upon metals in the way of ſolution till they are fuſed; nor does ſulphur diſſolve quickſilver till they are both reduced either to a fluid or very ſubtile ſtate by triture or melting; whence to promote the actions of menſtruums, we are directed to reduce both the ſolvent and ſolvend to minute parts, or the neareſt poſſible to a fluid ſtate, whether by heat, triture, fuſion, or otherwiſe. 8. That quickſilver is a true ſolvent of metals, ſo as to drink them in as water drinks in ſalts; by which means one metal may be readily united with another in any proportion by ſimple triture; and by this means, amalgamation and many operations in the ſublimer metallurgy are performed. 9. That acid ſpirits are not equally proper menſtruums to all the metals: thus ſpirit of nitre, though it diſſolves the reſt, will not diſſolve gold. 10. That all bodies in nature may become menſtruums to one another, each of them being, by ſome means or other, capable of having their parts uniformly interpoſed betwixt the ſmall parts of any of the reſt; thus even metals may, by art, be made to diſſolve in water, as we evidently ſee from numerous ſolutions of metals in acid ſpirits: theſe ſpirits being no more than water charged with the fine or more volatile parts of ſalts. 11. That the cauſe commonly aſſigned of ſolution, *viz.* the admiſſion of the fine particles of one body into the pores of another, whoſe figure fits them for their reception, is not juſt or adequate, but hypothetical and ill preſumed; ſince we find that ſome bodies will uniformly diſſolve their own quantity of others, as water does of Epſom-ſalt, alcohol of eſſential oils, mercury of metals, one metal of another, *&c.* whereas the ſum of the pores or vacuities of every body, muſt be neceſſarily leſs than the body itſelf, and conſequently thoſe pores cannot receive a quantity of matter equal to the body wherein they reſide. 12. That the diſſolving power of water may be immenſely increaſed by means of the digeſtor, from which inſtrument there are ſolid grounds of hope that it may, under a proper regulation, greatly contribute to the improvement of chemiſtry, natural philoſophy, and arts. See the article DIGESTOR.

13. Upon the whole, it ſhould ſeem that many deſireable improvements are derivable to arts from an improvement in the buſineſs of menſtruums. The diſcovery of that common menſtruum aqua fortis, introduced the art of aſſaying, and the ſcarlet-dye. That of alcohol introduced the arts of varniſhing and japaning. Numerous pigments for painters, colours for dyers, tan-liquors for tanners, the ſtaining of bone, horn, ivory, marble, various kinds of ink, tinctures, and ſolutions in medicine, chemiſtry, and other arts, have all reſulted from the diſcovery of menſtruums; yet this ſubject ſeems almoſt as new and rich as ever, ſo that numerous other diſcoveries of the ſame kind could not exhauſt it.

Univerſal MENSTRUUM. See the article ALKAHEST.

MENSURATION, in general, denotes the act or art of meaſuring lines, ſuperficies, or ſolids. See DISTANCE, GAUGING, HEIGHT, SURVEYING, *&c.*

MENTHA, MINT, in botany. See the article MINT.

MENTZ, the capital of one of the electorates of the ſame name in Germany, ſituated at the confluence of the rivers Rhine and Maine: eaſt long. 8°, and north lat. 50°.

MENTZELIA, in botany, a genus of the polyandria-monogynia claſs of plants, the flower of which conſiſts of five patent petals: the fruit is an oblong, unilocular capſule, containing a number of ſmall roundiſh ſeeds.

MENYANTHES, BUCKBEAN, in botany, a genus of the pentandria-monogynia claſs of plants, with a monopetalous funnel-like flower, divided into five deep ſegments at the limb: the fruit is an oval capſule with one cell, containing a great many ſmall ſeeds.

Buckbean, called by authors trifolium paluſtre and paludoſum, and by Tournefort nymphoides, is greatly recommended as a diuretic, in dropſical caſes; as alſo in the cure of intermittent fevers, and diſorders of the breaſt ariſing from tough

tough matter in the lungs: the general way of taking it is in a ſtrong infuſion, though many prefer the juice freſh expreſſed from the leaves.

MEOTIS, or PALUS MEOTIS, a ſea of Turky, which divides Europe from Aſia, extending from C im Tartary to the mouth of the river Don, or Tanais.

MEPPEN, a city of Germany, in the circle of Weſtphalia, and biſhopric of Munſter: eaſt long. 7°, north lat. 52° 55′.

MEQUENENCA, a city of Spain, in the province of Arragon, fifty miles ſouth-eaſt of Saragoſſa.

MEQUINEZ, a city of Fez, in the empire of Morocco: weſt long. 6°, north lat. 34°.

MERAN, or MORAN, a city in the circle of Auſtria and county of Tyrol: eaſt long. 11° 15′, north lat. 46° 40′.

MERCATOR's SAILING, that performed by Mercator's chart. See the articles CHART and NAVIGATION.

MERCATOR's *projection of maps*. See the article MAP.

MERCHANT, a perſon who buys and ſells commodities in groſs, or deals in exchanges; or that traffics in the way of commerce, either by importation or exportation. Formerly every one who was a buyer or ſeller in the retail way, was called a merchant, as they are ſtill both in France and Holland; but here ſhopkeepers, or thoſe who attend fairs or markets, have loſt that appellation.

Previous to a perſon's engaging in a general trade, and becoming an univerſal dealer, he ought to treaſure up ſuch a fund of uſeful knowledge, as will enable him to carry it on with eaſe to himſelf, and without riſking ſuch loſſes as great ill-concerted undertakings would naturally expoſe him to. A merchant ſhould therefore be acquainted with the following parts of commercial learning: 1. He ſhould write properly and correctly. 2. Underſtand all the rules of arithmetic that have any relation to commerce. 3. Know how to keep books of double and ſingle entry, as journals, a ledger, &c. 4. Be expert in the forms of invoices, accounts of ſales, policies of inſurance, charter-parties, bills of lading, and bills of exchange. 5. Know the agreement between the money, weights and meaſures of all parts. 6. If he deals in ſilk, woollen, linen, or hair manufactures, he ought to know the places where the different ſorts of merchandizes are manufactured, in what manner they are made, what are the materials of which they are compoſed, and from whence they come, the preparations of theſe materials before working up, and the places to which they are ſent after their fabrication. 7. He ought to know the lengths and breadths which ſilk, woollen, or hair-ſtuffs, linen, cottons, fuſtians, &c. ought to have according to the ſeveral ſtatutes and regulations of the places where they are manufactured, with their different prices, according to the times and ſeaſons; and if he can add to his knowledge the different dyes and ingredients which form the various colours, it will not be uſeleſs. 8. If he confines his trade to that of oils, wines, &c. he ought to inform himſelf particularly of the appearances of the ſucceeding crops, in order to regulate his diſpoſing of what he has on hand; and to learn as exactly as he can, what they have produced when got in, for his direction in making the neceſſary purchaſes and engagements. 9. He ought to be acquainted with the ſorts of merchandize found more in one country than another, thoſe which are ſcarce, their different ſpecies and qualities, and the propereſt method for bringing them to a good market, either by land or ſea. 10. To know which are the merchandizes permitted or prohibited, as well on entering as going out of the kingdoms or ſtates where they are made. 11. To be acquainted with the price of exchange, according to the courſe of different places, and what is the cauſe of its riſe and fall. 12. To know the cuſtoms due on importation or exportation of merchandizes, according to the uſage, the tarifs, and regulations of the places to which he trades. 13. To know the beſt manner of folding up, embaling, or tunning the merchandizes for their preſervation. 14. To underſtand the price and condition of freighting and inſuring ſhips and merchandize. 15. To be acquainted with the goodneſs and value of all neceſſaries for the conſtruction and repairs of ſhipping, the different manner of their building, what the wood, the maſts, cordage, cannons, ſails, and all requiſites may coſt. 16. To know the wages commonly given to the captains, officers, and ſailors, and the manner of engaging with them. 17. He ought to underſtand the foreign languages, or at leaſt as many of them as he can attain to; theſe may be reduced to four, viz. the Spaniſh,

Spaniſh, which is uſed not only in Spain, but on the coaſt of Africa, from the Canaries to the Cape of Good Hope: the Italian, which is underſtood on all the coaſts of the Mediterranean, and in many parts of the Levant: the German, which is underſtood in almoſt all the northern countries; and the French, which is now become almoſt univerſally current. 18. He ought to be acquainted with the conſular juriſdiction, with the laws, cuſtoms, and uſages of the different countries he does or may trade to; and in general all the ordinances and regulations, both at home and abroad, that have any relation to commerce. 19. Though it is not neceſſary for a merchant to be very learned, it is proper that he ſhould know ſomething of hiſtory, particularly that of his own country, geography, hydrography, or the ſcience of navigation; and that he is acquainted with the diſcoveries of the countries in which trade is eſtabliſhed, in what manner it is ſettled, of the companies formed to ſupport thoſe eſtabliſhments, and of the colonies they have ſent out.

All theſe branches of knowledge are of great ſervice to a merchant who carries on an extenſive commerce; but if his trade and his views are more limited, his learning and knowledge may be ſo too: but a material requiſite for forming a merchant is, his having on all occaſions a ſtrict regard to truth, and his avoiding fraud and deceit as corroding cankers that muſt inevitably deſtroy his reputation and fortune.

Trade is a thing of ſo univerſal a nature, that it is impoſſible for the laws of England, or of any other nation, to determine all the affairs relating to it; therefore all nations, as well as Great Britain, ſhew a particular regard to the law merchant, which is a law made by the merchants among themſelves: however, merchants and other ſtrangers are ſubject to the laws of the country in which they reſide. Foreign merchants are to ſell their merchandize at the port where they land, in groſs, and not by retail; and they are allowed to be paid in gold or ſilver-bullion, in foreign coin or jewels, which may be exported. If a difference ariſes between the king and any foreign ſtate, the merchants of that ſtate are allowed ſix months time to ſell their effects and leave the kingdom, during which time they are to remain free and unmoleſted in their perſons and goods. See the articles COMMERCE and NAVAL AFFAIRS.

MERCURIAL, ſomething conſiſting of or relating to mercury. See MERCURY. The efficacy of mercurial medicines depends on the extreme fineneſs and great weight of their particles, whereby they penetrate into the inmoſt receſſes of the animal ſtructure, and there remove obſtructions. However, as they tend to quicken the circulation of the blood, their uſe in hectical caſes ſeems dangerous.

MERCURIALIS, MERCURY, in botany, a genus of the dioecia ennendria claſs of plants, with an apetalous flower, conſiſting only of ſtamina: the fruit is a large bilocular capſule, with a ſingle roundiſh ſeed in each cell.

MERCURIFICATION, in chemiſtry, the method of ſeparating the mercuries of metals, which is moſt eaſily effected by means of a burning-glaſs; for the metal being placed in its focus, its mercurial parts are ſaid to fly off in ſmoke, which when condenſed and collected, appears to be true quickſilver.

MERCURY, in natural hiſtory, a ſemimetal naturally fluid, and the heavieſt of all known bodies except gold: it is ſo perfectly homogeneous and ſimple in its nature, that it is a queſtion whether gold itſelf be more ſo: when perfectly purified, it appears the ſame in all its parts, as far as our utmoſt teſts can go, till we come to that ſevere trial, the ſolar fire. It penetrates the parts of all the other metals, renders them brittle, and in part diſſolves them. It is wholly volatile in the fire, and may be driven up in vapour by a degree of heat very little greater than that of boiling water. It is the leaſt tenacious of all known bodies, for its parts ſeparate into more minute ones of the ſame figure, with the ſmalleſt force. It is, indeed, the moſt diviſible of all bodies, for the vapour, in form of which it riſes in evaporation, is almoſt too thin to be diſtinguiſhed from the ambient air, yet this is pure unaltered mercury; for if it is received into cold water, it forms itſelf again into regular round drops. Notwithſtanding a ſmall heat ſerves to evaporate mercury, yet if it be kept in a degree ſmaller than that, in a veſſel carefully cloſed, a long continuance of that heat will reduce it to a red calx in form of powder, and this may be again revived into fluid mercury by a gentle heat given it in ſtratification with charcoal-duſt. If it be placed in its crude ſtate in the focus of a great burning-

glaſs,

glaſs, it is immediately diſſipated in fumes, and leaves no remainder: but if inſtead of crude mercury, this red calx be uſed, it runs into a kind of glaſs, and immediately afterwards evaporates, leaving a ſmall quantity of duſky powder behind, which, on being further urged by the ſame intenſe heat, vitrifies and flies off as the other part had done: but if this calx be expoſed upon a piece of charcoal, the effect is the ſame, as in giving it the heat of a common fire with charcoal-duſt, it runs into liquid mercury, and immediately afterwards evaporates. It appears, therefore, that mercury, ſimple as it ſeems to be, is compoſed of a vitrifiable earth, and a ſulphur, which laſt gives it the brightneſs and appearance of metal; for when robbed of this, it ceaſes to be bright and metalline, and again recovers thoſe qualities on its being added again, tho' from no other ſubſtance than charcoal. It is poſſible to calcine mercury to ſuch a degree, that it ſhall bear heating red hot in a crucible without evaporation. The penetrating power of mercury is ſo great, that in ſalivations any thing of gold worn by the perſons, will be amalgamated with the fumes of it paſſing thro' the ſkin, and will be rendered white and ſoft by it.

It diſſolves very readily in the ſtronger acid menſtrua, and what is very ſingular, in aqua fortis and aqua regia indifferently, while the other metals in general that are ſoluble in one of theſe, are not to be affected by the other. With oil of vitriol, it yields us the yellow emetic powder called turbith mineral; and with ſpirit of ſea-ſalt, corroſive ſublimate. The ſpecific gravity of pure mercury is to water as 14020 to 1000; and as it is the heavieſt of all fluids, it is alſo the coldeſt: common water is much more cold to the touch, under the ſame circumſtances, than ſpirit of wine, and conſequently, mercury than either; and when heated, mercury is in an equal degree the hotteſt of all fluids; that heat, which given to water would ſcarce be felt by the fleſh, will burn it if given to mercury.

Mercury readily mixes with gold, ſilver, lead and tin, among the metals, and with zink and biſmuth, among the ſemimetals. See AMALGAMATION.

But notwithſtanding this, it does not eaſily blend with any other ſubſtance, except by the means of fire, or of trituration: by either of theſe methods, it may be blended intimately with ſulphur; by the former, into a red matter; by the latter, into a black powder, called æthiops mineral. See ÆTHIOPS MINERAL.

No drug ought to be ſo carefully examined as to its purity as mercury, as none is ſo frequently ſophiſticated. The weighing it hydroſtatically is the ſureſt of all means to find out this adulteration; or it may be diſcovered by evaporating a little of it, to try if any thing will remain behind: or when it is adulterated in the common way with lead, by grinding it in a mortar with vinegar. This mild acid is a menſtruum for lead, though not for mercury, and conſequently if there has been lead mixed among the mercury, it will grow ſweet to the taſte, but if the mercury be pure, it will remain unaltered.

The ores of mercury are of various kinds, but the moſt general one is known by the name of cinnabar, which very readily parts with its quickſilver, on its being diſtilled in a glaſs retort, with the addition of quick-lime or iron-filings. In many places it is ſeparated by burying certain earthen veſſels in the earth, and inverting into them others containing cinnabar, and ſtopped with a bundle of moſs; when a fire being made above theſe, the quickſilver runs through the moſs, and is ſaved in the under veſſel. The ſulphur is not ſo eaſily ſeparated from this mineral in its proper form, but if it be boiled in a ſtrong lixivium of wood-aſhes, and diſtilled vinegar be added to the clear liquor, it will be precipitated. For the properties and virtues of native and factitious cinnabar, ſee the article CINNABAR.

Mercury is not only found in cinnabar and other ores, but is ſometimes found with in its pure and fluid ſtate, lodged in the accidental cavities of hard ſtone; for when the workmen who ſearch for its ore accidentally break into theſe cavities, it runs out like water. The unhappy creatures who work in theſe mines ſeldom live more than three or four years, and then die in a moſt miſerable manner; and the people who work in any other manner in abundance, and with a conſtancy, are as certain of miſchief from it, being always afflicted with palſies and tremblings of the limbs. We have alſo had abundant experience of the common mercurial unguents, and from the method of taking it internally, that when proper care has not been ta-

the nerves have frequently been terribly hurt by it, the humours colliquated, and beſide the common ſymptoms of a ptyaliſm, ulcers of the mouth and throat, and diarrhœas of the moſt dangerous kind, have been brought on.

However, under proper regulations, it is a moſt powerful and noble medicine. Its virtues in opening the obſtructed paſſages, and in attenuating tough and viſcid humours in the very remoteſt parts of the body, are ſuperior to thoſe of almoſt any other medicine. Whence it is found of great uſe in ſtoppages of the glands, in ſchirroſities of the ſpleen and meſentery, and in ſtrumous and ſcrophulous caſes. It is alſo well known to be ſuperior to any thing in the itch, and other cutaneous eruptions of the moſt malignant kind, and alſo in venereal ulcers.

On its being imported it pays a duty of $6\frac{97\frac{1}{2}}{100}$d. the pound, and draws back on exportation $6\frac{12}{100}$d.

Crude mercury is beſt prepared for internal uſe by diſtilling it in a retort; and a good method of giving it in ſmall doſes, is the rubbing it with fine ſugar in a mortar, with a ſmall proportion of oil of almonds, till it is perfectly blended with the ſugar.

Crude mercury is an ingredient in many of the ointments and plaſters of the ſhops, and is frequently ordered in extemporaneous preſcriptions. In this caſe the common method of giving it is in the form of pills, in which it is killed with turpentine, and mixed with other ingredients principally of the purging kind.

Preparations of MERCURY, now in uſe in the ſhops, are chiefly theſe, 1. æthiops mineral: 2. factitious cinnabar: turbith mineral: 4. white precipitate: 5. corroſive mercury ſublimate: 6. mercurius calcinatus, commonly called precipitate per ſe: 7. red mercurial corroſive: 8. coralline mercury: and, 9. mercurius dulcis.

For the manner of preparing the four firſt of theſe, ſee ÆTHIOPS MINERAL, CINNABAR, *&c.*

Corroſive mercury ſublimate, or white corroſive mercury, is prepared in the following manner: take of purified mercury, forty ounces; of ſea-ſalt, thirty-three ounces; of nitre, twenty-eight ounces, and of calcined green vitriol, ſixty-three ounces. Rub the quickſilver firſt in an ounce or more of corroſive ſublimate, in a wooden or ſtone-veſſel, till it be broken into ſmall grains; then mix with it the nitre, afterwards the ſea-ſalt, till the mercury quite diſappears; laſtly, add the calcined vitriol, but do not rub the mixture too long with it, leſt the quickſilver ſhould begin to part again; put the whole into a matraſs with an alembic-head, and ſublime it. The corroſive ſublimate will be found in the head, and a ſpirit in a ſmall quantity will run into the receiver. This is a terrible poiſon, and corrodes every part it touches as it goes down into the ſtomach; it is therefore only uſed externally, for eating down proud fleſh, and cleanſing old and foul ulcers. Mercurius calcinatus, or calcined mercury, commonly called precipitate per ſe, is thus prepared: ſet purified mercury upon a ſand-heat for ſeveral months, in a glaſs-veſſel with a broad bottom, and a ſmall aperture to let in the air, till it be reduced to a red powder. This preparation is in great eſteem in all caſes in which mercurials are proper: two or three grains are generally given for a doſe. Red mercurial corroſive, improperly called red precipitate, is thus prepared: take any quantity of purified mercury, put it into a flat-bottomed glaſs, and add to it an equal quantity in weight of aqua fortis: ſet the mixture in a ſand-heat till all the moiſture is evaporated, and the maſs at bottom has acquired a fine red colour. This is a mild eſcharotic, and is uſed in eating down carnoſities and proud fleſh in ulcers, which it performs with very little pain. Coralline mercury, or arcanum corallinum, is thus prepared: pour upon the mercurial red corroſive thrice its weight of rectified ſpirit of wine, and digeſt them together two or three days in a gentle heat, often ſhaking the veſſel: then ſet fire to the ſpirit, ſtirring the powder continually till the ſpirit is quite burnt away. This powder is given in ſmall doſes of two or three grains. For the manner of preparing mercurius dulcis, alſo called draco mitigatus, aquila alba, and calomel. See CALOMEL.

Animated MERCURY. See ANIMATED.

MERCURY, ☿, in aſtronomy, the ſmalleſt of the planets, and the neareſt the ſun. See the article COPERNICAN.

Its mean diſtance from the ſun is 387 of ſuch parts of which the earth is 1000, its excentricity is 80 of ſuch parts. The inclination of its orbit is 6° 54′; it per-

performs its revolution round the ſun in 87 days, 23 hours, 16′; its greateſt elongation is about 22° 46′. The place in the ecliptic for the aſcending node is in 14° 42′ of taurus. Its diameter to that of the earth is as 3 to 4: and therefore the globe of mercury will be to that of the earth as 2 to 5.

Mercury, in the ſame manner as venus, always keeps himſelf in the neighbourhood of the ſun, and never recedes from him ſo far as venus does; he hides himſelf ſo much in the ſplendor of the ſun's rays, that he is but ſeldom ſeen by us on the earth: but ſince the invention of teleſcopes, he has been frequently obſerved, when in conjunction with the ſun, to paſs under his diſk like a black ſpot. The exceeding brightneſs by which mercury outſhines all the planets, does evidently prove him to be much nearer the ſun than any of the reſt; for the nearer any body is to the ſun, the greater illuſtration it receives from him. From all this it is evident, that mercury does likewiſe go round the ſun in a leſſer orbit, included within the orbit of venus. See the article VENUS.

Again, whatever is demonſtrated concerning the motions of venus, is likewiſe true, and to be underſtood of the motions of mercury; but the conjunctions of mercury with the ſun, his directions, ſtations, and retrogradations, are more frequent than in venus; for mercury circulating faſter, and in a leſſer orbit than venus, does oftner overtake the earth than ſhe. Hence it is plain, that the motions of theſe two planets ſeen from the earth, are very irregular and unequal, ſince they are ſometimes ſeen to have a motion forward; ſometimes they appear immoveable, or ſtationary, after this they change their courſe, and move backwards, and after ſuch a regreſſion they again take up their ſtations, and keep for ſome time the ſame place in the zodiac; whereas a ſpectator in the ſun will always obſerve theſe planets to go forward with a motion regulated after a certain rate; for the apparent inequality of theſe motions, ſeen from the earth, is ſuch as exactly anſwers to a regular motion round the ſun: and therefore it is manifeſt that the ſun, and not the earth, is the center of theſe planets motions.

Dr. Halley, in his obſervation of mercury, ſeen in the ſun, A. D. 1677, at St. Helena, ſays, that this planet may be ſeen nine times in the ſun, near the aſcending node, A. D. 1710, 1723, 1736, 1743, 1756, 1769, 1776, 1782, 1789, in October, and four times near the other node, in the month of April, A. D. 1707, 1753, 1786, 1799; all in this century.

Dr. Gregory, in his elements of aſtronomy, deſcribes the phænomena that will appear to the eye in mercury: he ſays, that beſides the phænomena of the order of the fixed ſtars, which agree alike with an eye placed any where within the orbit of ſaturn, it is plain that the eye, poſited in mercury, will ſee the ſun almoſt three times broader than we ſee it from the earth, becauſe that planet is almoſt three times nearer to the ſun than the earth. Whence alſo the ſolar diſk, ſeen from mercury, is ſeven times greater than the diſk as it appears to us, and mercury has ſeven times more light and heat, *cæteris paribus*, than the earth. But theſe qualities are much more or leſs intenſe, according to the different diſtance of mercury from the ſun; for its orbit is much more excentric, than the orbit of any other planet.

The accelerating gravity, towards the ſun, is alſo ſeven times greater there than here.

It has not yet been found by obſervation, whether mercury turns upon its own axis, and therefore it cannot be certainly defined, whether to an eye, placed on its ſurface, all the things without will appear to revolve with a contrary motion; that is, whether it has the viciſſitude of day and night, much leſs what is the ſpace of its nychthemeron, or natural day: but we may ſafely enough conjecture, that it does revolve about its axis, ſince other planets do. But the year of mercury is ſcarce equal to a quarter of our year, tho' it is uncertain whether it has different ſeaſons, becauſe they depend upon the inclination of the axis of its rotation, which is unknown, to the plane of the orbit which it deſcribes about the ſun. The eye placed in mercury, looking at the ſun, will ſee the ſun's ſpots (when it has any) ſometimes in a right line croſſing his diſk from eaſt to weſt, at another time their way will appear elliptical and curved, towards one ſide or the other, and all the variety of this phænomenon will happen in one year, in which the track or way of the ſpots will appear twice rectilineal. But the way of the ſolar ſpots, ſeen from mercury, will be always almoſt ſtraight; becauſe mercury never declines much from

from the plane of the ſun's equator, and therefore not ſenſibly from the planes of the circles, which the ſpots deſcribe by their rotation. And as the plane of the orbit of the earth is moſt of all inclined to the ſaid plane of the ſun's equator, the way of the ſpots, ſeen from the earth, appears more curved than if the ſun was ſeen from any other planet. This curvature will be ſomething leſs, ſeen from jupiter or mars; and yet leſs from ſaturn, leſs ſtill from venus, and leaſt of all from mercury, as we have juſt obſerved.

The other five planets are ſuperior to mercury, therefore their phænomena are to an eye placed in mercury, as the phænomena of mars, jupiter and ſaturn, ſeen from the earth. Therefore venus and the earth, when they are in oppoſition with the ſun, will ſhine with a full orb, and reflecting the ſun's rays very directly, will ſhine upon mercury all night, and powerfully expel the darkneſs. For ſince venus, when it is horned, and ſhews the leaſt part of its enlightened hemiſphere to the inhabitants of the earth, is ſo bright as to caſt a ſhadow, it will appear very bright to mercury, to which it turns its whole enlightened hemiſphere.

Mercury ſees no inferior planet known to us, conſequently ſees no celeſtial body falcated or horned; and therefore a ſpectator there, will want the argument taken from ſuch phaſes of the planets, to eſtabliſh the true ſyſtem of the world; for the phaſes of the inferior planets have clearly ſhewn that they moved about the ſun; whence it was natural to think the ſame of the other motions. But nevertheleſs, tho' we do not ſee any planets inferior to mercury, it does by no means follow that there are no ſuch: for mercury himſelf is ſeldom ſeen in our oblique ſphere, and one that ſhould be much inferior to it would never be ſeen, upon account of its nearneſs to the ſun.

MERCURY, in heraldry, a term uſed, in blazoning by planets, for the purple colour, in the arms of ſovereign princes. See the article BLAZONING.

MERCURY, in matters of literature, denotes a book, or other paper, chiefly filled with news; ſo called from the pagan deity Mercury, who is ſaid to have been the meſſenger of the gods. Hence alſo the perſons employed to collect news, or diſtribute the news-papers, are called mercuries.

MERCY, *miſericordia*, in law. See the article MISERICORDIA.

MERCY-SEAT, or PROPITIATORY, in jewiſh antiquity. See PROPITIATORY.

MERGANSER, in ornithology, a ſpecies of mergus. See the next article.

MERGUS, in ornithology, a genus of birds, of the order of the anſeres, diſtinguiſhed by having the beak of a cylindrical figure, and hooked at the extremity, and its denticulations of a ſubulated form.

To this genus belongs the merganſer, with a hanging creſt, a bluiſh-black head, and a circle of white round the neck: the male and female, however, are ſo very unlike, that they have got diſtinct engliſh names; the former being called gooſeander, and the latter the dundiver, or ſparling fowl. There are ſeveral other ſpecies, diſtinguiſhed by their different colours.

MERIDIAN, in aſtronomy, a great circle paſſing through the poles of the world, and both the zenith and nadir, croſſeth the equinoctial at right angles, and divideth the ſphere into two hemiſpheres, the eaſtern and weſtern: it has its poles in the eaſt and weſt points of the horizon. It is called meridian, becauſe when the ſun cometh to the ſouth part of this circle, it is then mid-day; and then the ſun has his greateſt altitude for that day. Theſe meridians are various, and change according to the longitudes of places; ſo that they may be ſaid to be infinite in number, for all places from eaſt to weſt have their ſeveral meridians: but there is (or ſhould be) one fixed, which is called the firſt meridian. Ptolemy choſe to make that the firſt meridian which paſſes near the Fortunate iſlands, at about the diſtance of one degree from them; and reckons from thence to the eaſt thro' Africa and Aſia; chooſing to begin at a place inhabited, and which was then the bounds and limits of the known part of the earth to the weſt, and to end at the eaſtern ſhore of Scain in Aſia; but America being diſcovered not many ages ago, and long after Ptolemy's time, the firſt meridian was removed more to the weſt. Some made that the firſt meridian which paſſes through the iſle of St. Nicholas, which is one of thoſe near Cape Verd; and Hondius choſe the iſle of St. James to be the firſt in his maps.

Others choſe that which paſſes through the iſle del Corvo, one of the Azores,

becauſe the needle was found not to decline from the north there and in the adjacent ſeas, but to lie in the meridian line; and this beginning Mercator chooſes. But ſeeing there are other places where the needle points to the north, and it doth not ſo in every part of that meridian, geographers thought this not a ſufficient reaſon; ſome fixing it at the ſhore of Braſil, that runs out into the ſea. Later geographers chooſe to begin at the mountain Teneriff, in the Fortunate or Canary iſlands, which is counted one of the higheſt on the earth; and the rather becauſe they thought ſome remarkable place ſhould be choſen that might be moſt known to future ages; and ſo Ptolemy's firſt meridian, though long obſerved, was not laid aſide without good reaſon. The French, ſince the year 1634, have taken that which goes through the weſt part of the iſle of Fero, one of the Canaries. Aſtronomers alſo have taken divers places for the firſt meridian; the followers of Tycho fix it at Uraniburg, an iſland in the daniſh ſtreights, and calculate the celeſtial motions to that place, and from thence accommodate them to the reſt. Others chooſe other places, according to the authors of the ephemeris they uſe, who calculate the ephemeris, and the planets places for the meridian of their own place. As Riccioli, who fixed his firſt meridian at Bologna; Mr. Flamſteed, at the royal obſervatory at Greenwich; and the French, at the obſervatory at Paris. See OBSERVATORY.

But without regard to any of theſe rules, our geographers and map-makers frequently aſſume the meridian of the place, or the capital of the country, for the firſt meridian; and thence reckon the longitudes of their places.

In the Philoſophical Tranſactions, there is a ſuggeſtion that the meridians vary in time. This ſeems very probable, from the old meridian line in the church of St. Petronio at Bologna, which is found to vary no leſs than eight degrees from the true meridian of that place at this time; and from that of Tycho Brahe at Uraniburg, which M. Picart obſerves varies eighteen minutes from the modern meridian. If there be any thing of truth in this hint, Dr. Wallis ſays, the change muſt ariſe from a change of the terreſtrial poles (here on earth, of the earth's diurnal motion) not of their pointing to this or that of the fixed ſtars: for if the poles of the diurnal motion remain fixed to the ſame place on the earth, the meridians which paſs through theſe poles muſt be the ſame.

But this notion of the changes of the meridian, ſeems overthrown by an obſervation of M. Chazelles, of the french academy of ſciences, who, when in Egypt, found that the four ſides of a Pyramid built 3000 years ago, ſtill looked very exactly to the four cardinal points; a poſition, which could never be looked on as fortuitous.

The meridian on the globe or ſphere, is repreſented by the brazen circle, in which the globe hangs and turns. It is divided into four times 90, or 360°, beginning at the equinoctial. See GLOBE. On it, each way from the equinoctial, on the celeſtial globes, is counted the ſouth and north declination of the ſun or ſtars; and on the terreſtrial globe, the latitude of places north or ſouth. There are two points of this circle, which are called the poles of the world; and a diameter continued from thence through the center of either globe, is called the axis of the earth or heavens, on which they are ſuppoſed to turn round. On the terreſtrial globes there are uſually thirty-ſix meridians drawn, one thro' every tenth degree of the equator, or thro' every tenth degree of longitude. The uſes of this circle are. 1. To ſet the globes to any particular latitude. 2. To ſhew the ſun's or a ſtar's declination, right aſcenſion, or greateſt altitude, &c.

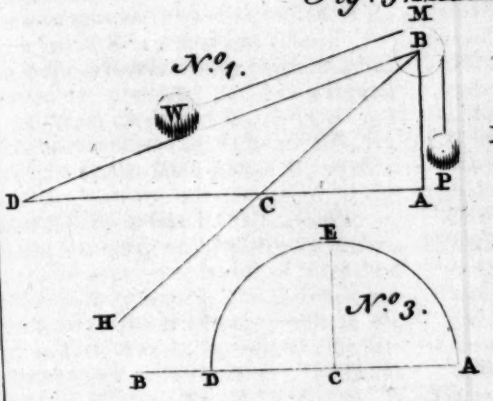
To find the ſun's MERIDIAN *altitude or depreſſion at night, by the globes.* Bring the ſun's place to the meridian above the horizon for his altitude at noon; which will ſhew the degrees of it, counted from the horizon. For his midnight depreſſion below the north-point of the horizon, you muſt bring the oppoſite point to the ſun's preſent place, as before to the meridian; and the degrees there intercepted between that point and the horizon, are his midnight depreſſion.

Meridian line is an arch or part of the meridian of a place, terminated each way by the horizon. Or it is the interſection of the plane of the meridian of the place with the plane of the horizon, vulgarly called a north and ſouth line, becauſe its direction is from one pole towards the other. It is of great uſe in aſtronomy, geography, dialling, &c. and on its exactneſs all depends; whence divers aſtronomers have took infinite

Fig. 2. MELES, the BADGER.

Fig. 1. MATRICARIA.

Fig. 3. MAXIMUM.



N.° 2.

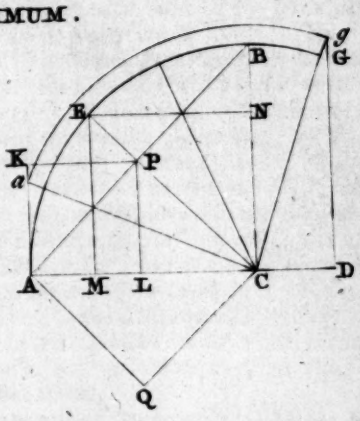


Fig. 4. MERIDIAN.

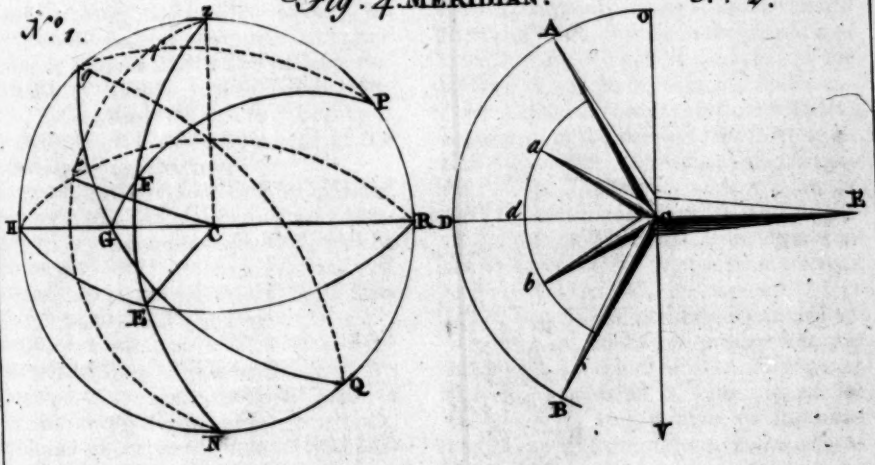
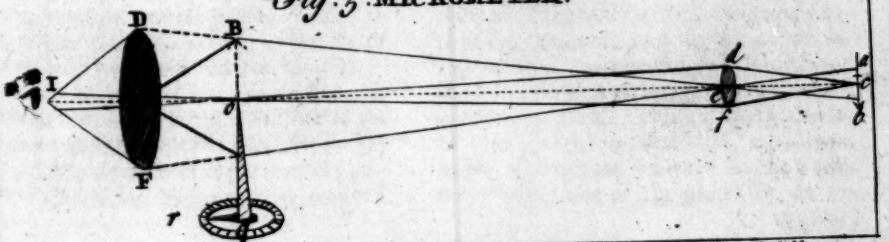


Fig. 5. MICROMETER.



J. Jefferys sculp.

BRITISH MUSEUM

finite pains to have it to the laſt preciſion.

To draw a MERIDIAN *line.* Knowing the ſouth quarter pretty nearly, obſerve the altitude F E (plate CLXXI. fig. 4. n° 1. of ſome ſtar on the eaſtern ſide thereof, not far from the meridian H Z R N: then, keeping the quadrant firm on its axis, ſo as the plumbet may ſtill cut the ſame degree, only directing it to the weſtern ſide of the meridian, wait till the ſtar has the ſame altitude as before, *f e*. Laſtly, biſſect the angle E C *e*, formed by the interſection of the two planes wherein the quadrant is placed at the time of the two obſervations, by the right line H R. This line H R is a meridian line.

Or thus: which is a very eaſy and good method for practice. On an horizontal plane, from the center C, (*ibid*, n° 2.) deſcribe ſeveral concentric arches B A, *b a*, &c. and on the ſame center C, erect a ſtyle or gnomon, perpendicular to the plane A C B, a foot or half a foot long. About the time of the tropics before noon, between the hours of nine and eleven in the morning, and between one and three in the afternoon, obſerve the points B, *b*, &c. A, *a*, wherein the ſhadow of the ſtyle terminates. Biſſect the arches A B, *a b*, &c. in D, *d*, &c. If then the right line D E biſſect all the arches A B, *a b*, &c. it will be the meridian line ſought. As the extremity of the ſhadow is ſomewhat hard to determine, it will be convenient to have the ſtyle flat at the top, and to drill a little hole, noting the lucid ſpot projected by it on the arches A B and *a b*, inſtead of the extremity of the ſhadow.

Hence, if the meridian line be biſſected by a right line O V, drawn perpendicularly through the point C, O V, will be the interſection of the meridian, and firſt vertical, and conſequently O will ſhew the eaſt point, and V the weſt.

MERIDIAN LINE, on a dial, is a right line ariſing from the interſection of the meridian of the place, with the plane of the dial: this is the line of twelve o'clock, and from hence the diviſion of the hour-lines begins. See the article DIAL.

Magnetical MERIDIAN, is a great circle paſſing through the magnetical poles, to which the magnetic needle, or needle of the mariner's compaſs, conforms itſelf.

MERIDIAN *altitude of the ſun or ſtars*, is their altitude when in the meridian of the place where they are obſerved. Or it may be defined, an arch of a great circle perpendicular to the horizon, and comprehended between the horizon and the ſun or ſtar then in the meridian of the place.

To take the MERIDIAN *altitude with a quadrant.* If the poſition of the meridian be known, and the plane of an aſtronomical quadrant be placed in the meridian line, by means of the plumb-line ſuſpended at the center, the meridian altitudes of the ſtars, which are the principal obſervations whereon the whole art of aſtronomy is founded, may eaſily be determined. The meridian altitude of a ſtar may likewiſe be had by means of a pendulum-clock, if the exact time of the ſtar's paſſage by the meridian be known. Now it muſt be obſerved, that ſtars have the ſame altitude for a minute before and after their paſſage by the meridian, if they be not in or near the zenith; but if they be, their altitudes muſt be taken every minute when they are near the meridian, and their greateſt altitudes will be the meridian altitudes ſought. See QUADRANT.

MERIDIONAL DISTANCE, in navigation, is the ſame with the departure, eaſting or weſting, or the difference of longitude between the meridian under which the ſhip now is, and any other meridian ſhe was before under.

MERIDIONAL PARTS, MILES, or MINUTES, in navigation, are the parts by which the meridians in Mr. Wright's chart (commonly though falſely called Mercator's) do increaſe as the parallels of latitude decreaſe: and as the coſine of the latitude of any place, is equal to the radius or ſemi-diameter of that parallel; therefore, in the true ſea-chart, or nautical planiſphere, this radius being the radius of the equinoctial, or whole ſine of 90°, the meridional parts at each degree of latitude muſt increaſe, as the ſecants of the arch, contained between that latitude and the equinoctial, do decreaſe. The tables therefore of meridional parts, which we have in books of navigation, are made by a continual addition of ſecants; they are calculated in ſome books for every degree and minute of latitude; and they will ſerve either to make or graduate a Mercator's chart, or to work the Mercator's ſailing. To uſe them, you muſt enter the table with the degree of latitude at the head, and the minute on the firſt column towards the left hand, and in the angle of meeting you will have the meridional parts. Having the latitudes of two places, to find the meridional miles or minutes between them, conſider whether one of the places lies on the equator,

equator, or both on the same side of it, or, lastly, on different sides. 1. If one of the proposed places lies on the equator, then the meridional difference of latitude is the same with the latitude of the other place, taken from the table of meridional parts. 2. If the two proposed places be on the same side of the equator, then the meridional difference of latitude is found by subtracting the meridional parts answering to the least latitude, from those answering to the greatest, and the difference is that required. 3. If the places lie on different sides of the equator, then the meridional difference of latitude is found by adding together the meridional parts answering to each latitude, and the sum is that required.

We have here added a table of meridional parts calculated both for the sphere and oblate spheroid, by the reverend Mr. Murdoch, in his new and learned Treatise of Mercator's Sailing applied to the true Figure of the Earth. By this table may be projected a true chart, for any part of the earth's surface, and the several problems of sailing may be solved by it. Maps of countries may be delineated and applied to the various purposes of navigation, geography, and astronomy. Nor are the errors of the common spherical projections so very small in many cases, as to be inconsiderable and not dangerous. For instance, if a ship sails from south latitude 25°, to north latitude 30°, and the angle of the course be 43°; then the difference of longitude by the common table would be 3206′, exceeding the true difference 3141′ by 65′, or miles. Also the distance sailed would be 4512, exceeding the true distance, 4423, by 89′, or miles; which differences are too great to be neglected. For other instances of such a correction of the charts, we refer to the author's admirable book above-mentioned.

A Table of meridional Parts to the Spheroid and Sphere, with their Differences.

D.	Spheroid.	Sphere.	Diff.
1	58.7	60.0	1.3
2	117.3	120.0	2.7
3	176.1	180.1	4.0
4	234.9	240.2	5.3
5	293.8	300.4	6.6
6	352.7	360.6	7.9
7	411.8	421.0	9.2
8	471.0	481.5	10.5
9	530.4	542.2	11.8
10	589.9	603.0	13.1
11	649.7	664.1	14.4
12	709.6	725.3	15.7
13	769.8	786.8	17.0
14	830.2	848.5	18.3
15	890.9	910.5	19.6
16	951.8	972.7	20.9
17	1013.1	1035.3	22.2
18	1074.8	1098.3	23.5
19	1136.8	1161.6	24.8
20	1199.2	1225.2	26.0
21	1262.0	1289.2	27.2
22	1325.3	1353.7	28.4
23	1389.0	1418.6	29.6
24	1453.3	1484.1	30.8
25	1518.0	1550.0	32.0
26	1583.3	1616.5	33.2
27	1649.1	1683.5	34.4
28	1715.6	1751.2	35.6
29	1782.7	1819.5	36.8
30	1850.5	1888.4	37.9
31	1919.0	1958.0	39.0
32	1988.2	2028.3	40.1
33	2058.3	2099.5	41.2
34	2129.0	2171.4	42.3
35	2200.8	2244.2	43.4
36	2273.4	2317.9	44.5
37	2347.0	2392.6	45.6
38	2421.6	2468.3	46.7
39	2497.2	2544.9	47.7
40	2573.9	2622.6	48.7
41	2651.8	2701.5	49.7
42	2730.9	2781.6	50.7
43	2811.3	2863.0	51.7
44	2893.1	2945.8	52.7
45	2976.2	3029.9	53.7
46	3060.9	3115.5	54.6
47	3147.2	3202.7	55.5
48	3235.1	3291.5	56.4
49	3324.8	3382.1	57.3
50	3416.3	3474.5	58.2
51	3509.7	3568.8	59.1
52	3605.1	3665.2	59.9
53	3703.1	3763.8	60.7
54	3803.1	3864.6	61.5
55	3905.7	3968.0	62.3
56	4010.9	4073.9	63.0
57	4118.9	4182.6	63.7
58	4229.8	4294.2	64.4
59	4344.0	4409.1	65.1
60	4461.5	4527.3	65.8
61	4582.7	4649.2	66.5
62	4707.8	4775.0	67.2
63	4837.1	4904.9	67.8
64	4971.0	5039.4	68.4
65	5109.8	5178.8	69.0
66	5254.0	5323.6	69.6

D.	Spheroid.	Sphere.	Diff.
67	5403.9	5474.0	70. 1
68	5560.2	5630.8	70. 6
69	5723.5	5794.6	71. 1
70	5894.4	5965.9	71. 5
71	6073.7	6145.6	71. 9
72	6262.4	6334.7	72. 3
73	6461.6	6534.3	72. 7
74	6672.6	6745.7	73. 1
75	6896.8	6970.3	73. 5
76	7136.2	7210.0	73. 8
77	7393.0	7467.1	74. 1
78	7670.1	7744.5	74. 4
79	7970.9	8045.6	74. 7
80	8300.2	8375.2	75. 0
81	8663.8	8739 0	75. 2
82	9070.0	9145.4	75. 4
83	9530.2	9605.8	75. 6
84	10061.1	10136.9	75. 8
85	10688.7	10764.6	75. 9
86	11456.5	11532.5	76. 0
87	12446.0	12522.1	76. 1
88	13840.4	13916.4	76. 0
89	16223.8	16299.5	75. 7
90			37.75

MERIONETHSHIRE, a county of north Wales, bounded by Caernarvon and Denbighſhire on the north, by Montgomeryſhire on the ſouth-eaſt, and by the Iriſh ſea on the weſt.

MERIT, in theology, ſignifies deſert. This term is more particularly uſed to ſignify the moral goodneſs of the actions of men, and the rewards to which thoſe actions intitle them.

The romiſh ſchoolmen diſtinguiſh merit towards God into two kinds, *viz.* merit of congruity, and merit of condignity. The firſt, which is improperly called merit, is when there is no manner of proportion between the action and the reward, but he who beſtows it, ſupplies, by his goodneſs, what is wanting in the action. Merit of condignity is when there is a juſt and ſtrict proportion between the action and the reward, as in the wages of a workman. Proteſtants diſclaim all merit of this kind.

MERK, a river of the Auſtrian Netherlands, which riſes in the province of Brabant, and falls into the ſea, oppoſite to the iſland Overflackee in Holland.

MERLIN, *æſalon*, in ornithology, the leaſt of the hawk kind, but much reſembling the haggard-falcon.

The merlin, if well manned, makes an excellent hawk, which will naturally fly at a partridge, thruſh, or lark. See the articles FALCON and HAWK.

MERLON, in fortification, is that part of a parapet which is terminated by two embraſſures of a battery. Its height and thickneſs is the ſame with that of the parapet; but its breadth is generally nine feet on the inſide, and ſix on the outſide. It ſerves to cover thoſe on the battery from the enemy; and is better when made of earth well beat and cloſe, than when built with ſtone; becauſe theſe fly about and wound thoſe they ſhould defend.

MERLUCIUS, in ichthyology, a fiſh called in engliſh the hake. See HAKE.

MERMAID, or MERMAN, an imaginary animal, ſuppoſed to be half human and half fiſh; which probably took its riſe from an imperfect view of the fiſh called thrichechus. See THRICHECHUS.

MERNS, a county of Scotland, bounded by Mar on the north, by the German ocean on the eaſt, by Angus on the ſouth, and by Gowry on the weſt.

MERO, a town of the further india, ſituated in the kingdom of Pegu: eaſt long. 94°, and north lat. 17°.

MEROPS, the BEE-EATER, in ornithology, the blue-breaſted iſpida, with a variegated head; a very beautiful bird, ſomewhat larger than the common kingfiſher. See the article ISPIDA.

It catches bees and other flying inſects while on the wing, whence its engliſh name: they uſually fly in flocks, and make a loud but not diſagreeable noiſe, ſomewhat like that of a man whiſtling.

MERS, a county of Scotland, bounded by Lothian on the north, by the German ocean on the eaſt, by Northumberland and Tiviotdale on the ſouth, and by Tweedale on the weſt.

MERSBURG, a city of upper Saxony, in the marquiſate of Miſnia, ſixteen miles north-weſt Leipſic.

MERSPURG, a city of Germany, in the circle of Swabia and biſhopric of Conſtance, eight miles north eaſt of the city of Conſtance.

MERTOLA, a town of Portugal, in the province of Alentejo: weſt long. 8° 15′, and north lat. 37° 35′.

MERUE, the north branch of the river Maes, on which the city of Rotterdam is ſituated.

MERVILLE, a town of french Flanders, near the confines of Artois: eaſt longit. 2° 36′, and north lat. 50° 40′.

MERULA, the BLACKBIRD, in ornithology,

logy, a ſpecies of the turdus or thruſh-kind. See the article TURDUS.

It is about the ſize of the common thruſh, all over black, except the beak and eye-lids, which are yelloviſh.

There is alſo another ſpecies, called merula ſaxatilis, of a grey colour, with pinnated plumes: it is about the ſize of the former.

MESCHED, or THUS, a city of Perſia, in the province of Choraſſan: eaſt. lon. 57° 30′, and north lat. 36°.

MESEEN, the capital of a province of the ſame name, in Ruſſia: it is a port town, ſituated on the coaſt of the White-ſea, one hundred and fifty miles north-eaſt of Archangel.

MESEMBRYANTHEMUM, in botany, a genus of the polyandria-pentagynia claſs of plants, the corolla whereof conſiſts of a ſingle petal, with a multitude of petals of a lanceolated, narrow figure, formed into ſeveral ſeries a little longer than the cup, and cohering at the baſe by their ungues; the fruit is a fleſhy, roundiſh capſule, with a radiated umbilicus, and with a number of cells equal to that of the ſtyles; the ſeeds are numerous and roundiſh. The number of ſtyles is ſometimes ten, and ſometimes they, and the ſegments of the calyx, are only four.

This genus comprehends the ice-plant, and the flowering-kali.

MESENTERIC FEVER, called by Heiſter the ſtomachic or inteſtinal fever, and by Sydenham the new fever, is, by the generality of thoſe who have wrote about it, referred to the malignant kind from its being uſually attended with ſevere and uncommon ſymptoms. It differs from other acute fevers, according to Heiſter, in being always attended with a diarrhœa, which however is ſalutary, and is dangerous to ſtop. This fever has its ſeat in the ſtomach and inteſtines. Many of the diſtempers mentioned by authors under peculiar names, are properly to be referred, as to their cauſes, to this ſpecies of fever: the dyſenteric is abſolutely of this kind, and many of the petechial ones.

The patient is ſeized with this diſtemper, which returns at different and irregular intervals, with frequent ſhiverings; after theſe, the tongue, teeth, and fauces are covered with a foul and viſcid phlegm; the tongue in particular, after looking yelloviſh and blackiſh with it: the patient perceives a diſagreeable taſte in his mouth from this, and the people about him an ill ſmell: the hypochondria are always diſtended, and often in pain: the urine becomes turbid, and depoſites a muddy ſediment, during the whole courſe of the diſtemper. In the cure, all hot medicines muſt be avoided, and the diſcharge of the peccant matter by the diarrhœa muſt be promoted by clyſters and by purging medicines: ſome adviſe aloes and other medicines of that kind; others ſena and manna; ſome the purging ſalts; but moſt prefer rhubarb given in often repeated ſmall doſes: large draughts of the lubricating decoctions, ſuch as barley-water and water-gruel, are to be given, and emulſions of ſweet-almonds and of the cold ſeeds: ſmall quantities of oil of ſweet-almonds are alſo to be given at times, and juleps of the cooling waters, and ſyrups moderately acidulated; and powders of nitre, cinnabar, and the common abſorbents, as crab's eyes, and the like, are to be given, to take off the pains, and ſpaſms, and to attemperate the acid matter. The diet is not to be ſo very thin and weak as in other acute fevers, but moderate nouriſhment is to be allowed.

MESENTERY, in anatomy, a thick fat membrane, placed in the midſt of the inteſtines particularly of the ſmaller ones, whence it has the name. Its ſubſtance is compoſed of membranes, fat, veſſels of all kinds, and in the human body of a number of glands. In the upper part, it is connected with the three ſuperior vertebræ of the loins; and in the lower, with the inteſtines, and particularly with the jejunum and ileum; to which it alſo gives their outer coat. When it is ſeparated from the inteſtines, it has ſeveral folds reſembling gloves. Its length, in the whole, is about three ells; but the inteſtines which are joined to it, are at leaſt four times that length. Its coats or membranes are two, and between them there is a cellular ſubſtance, which contains the fat: the meſeraic veſſels and glands are alſo placed there, which many reckon a third coat of the meſentery, and that not improperly; this they call the tunica celluloſa.

The veſſels of the meſentery are blood-veſſels, nerves, lacteals, and lymphatics. The blood-veſſels are the ſame with thoſe of the inteſtines, and theſe make a multitude of ſtrange meanders, and have very frequent anaſtomoſes. The nerves all come from the par vagum, and the inte-

coſtal

coſtals. There are a multitude of glands diſperſed throughout the whole meſentery: theſe vary greatly in their ſize, figure, and ſituation in different ſubjects, and in old people they frequently almoſt diſappear. In comparative anatomy we find, that in dogs there is only one, but that very large, called pancreas Aſellii: the lacteal veſſels paſs thro' theſe glands. The uſes of the meſentery are, 1. To ſuſpend, connect together, and retain in their due place all the inteſtines. 2. To ſuſtain the ſanguiferous and lacteal veſſels of the inteſtines. And, 3. To make the way for the lacteals, to the receptacle, the ſhorter.

MESNE, in law, ſignifies him who is lord of a manor, and who hath tenants holding of him, yet himſelf holding of a ſuperior lord. This word alſo ſignifies a writ, which lies where there is a lord-meſne and tenant, and the tenant is diſtrained for ſervices due from the meſne to the ſuperior lord.

MESOCOLON, in anatomy, that part of the meſentery connected with the great gut, eſpecially the colon. See the article MESENTERY.

The meſocolon meets the midſt of the colon, to which it is joined. Its lower part ſticks to a part of the rectum.

MESOLABE, an inſtrument uſed by the antients for finding two mean proportionals mechanically, which they could not effect geometrically.

It conſiſted of three parallelograms, moving in a groove to certain interſections.

MESOLOGARITHMS, according to Kepler, are the logarithms of the coſines and co tangents, the former of which were called by lord Napier antilogarithms, and the latter differentials.

They are otherwiſe called artificial ſines and tangents. See LOGARITHM, SINE, TANGENT, *&c.*

MESOPLEURII, in anatomy, the intercoſtal muſcles. See INTERCOSTAL.

MESOPOTAMIA, the antient name of Diarbeck. See the article DIARBECK.

MESOPTERYGIUS, in ichthyology, a term applied to ſuch fiſhes as have only one back fin, and that ſituated in the middle of the back. See the article ICHTHYOLOGY.

MESPILUS, the MEDLAR, in botany, a genus of the icoſandria-pentagynia claſs of plants, the flower of which is made up of roundiſh hollow petals; and its fruit is an umbilicated globoſe berry, containin five oſſeous and gibbous ſeeds.

The fruit of the medlar is very grateful, though not eatable till rotten.

MESSASIPPI, or MESCHASIPPI, a country of North America, bounded by Canada on the north, the britiſh plantations on the eaſt, the gulph of Mexico on the ſouth, and the province of New Mexico on the weſt. See LOUISIANA.

MESSASIPPI, the river which gives name to the country, riſes in Canada, and runs to the ſouthward till it falls into the gulph of Mexico.

MESSENGERS, are certain officers chiefly employed under the direction of the ſecretaries of ſtate, and always in readineſs to be ſent with all kinds of diſpatches foreign and domeſtic. They alſo, by virtue of the ſecretaries warrants, take up perſons for high treaſon, or other offences againſt the ſtate. The priſoners they apprehend are uſually kept at their own houſes, for each of which they are allowed 6 s. 8 d. per day, by the government: and when they are ſent abroad, they have a ſtated allowance for their journey, *viz.* 30 l. for going to Paris, Edinburgh, or Dublin; 25 l. for going to Holland, and to other places in the ſame proportion; part of which money is advanced, for the expence of their journey. Their ſtanding ſalary is 45 l. *per annum*; and their poſts, if purchaſed, are eſteemed worth 300 l. The meſſengers wait twenty at a time, monthly, and are diſtributed as follows, *viz.* four at court, five at one ſecretaries office, five at another, two at the third for North Britain, three at the council-office, and one at the lord chamberlain's of the houſhold.

MESSENGERS *of the exchequer*, are four officers who attend the exchequer, in the nature of purſuivants, and carry the lord treaſurer's letters, precepts, *&c.*

MESSENGER *of the preſs*, a perſon, who, by order of the court, ſearches printing-houſes, bookſellers-ſhops, *&c.* in order to diſcover the printers or publiſhers of ſeditious books, pamphlets, *&c.*

MESSENGER *at arms*, in the ſcottiſh polity, officers whoſe buſineſs it is to execute ſummons and letters of diligence for civil debt, real or perſonal; thus called from the impreſs of the king's arms on their blazon, being a piece of braſs or ſilver fixed upon the meſſenger's breaſt, to diſcover his warrant and authority, when he diſcharges the duty of his office; and the reſiſting him therein, is a crime, in the law of Scotland, called deforcement. See the article DEFORCEMENT.

The meſſengers at arms, of whom there are a great number, are among the officers under the lyon, who, together with his brethren the heralds, is the judge of the malverſation of meſſengers. See COLLEGE *of Heralds*, KING *at Arms*, &c.

MESSIAH, the anointed; a title which the Jews gave to their expected great deliverer, whoſe coming they ſtill wait for: and a name the Chriſtians apply to Jeſus Chriſt, in whom the prophecies relating to the Meſſiah were accompliſhed. Among the Jews, anointing was the ceremony of conſecrating perſons to the higheſt offices and dignities; kings, prieſts, and ſometimes prophets were anointed: thus Aaron and his ſon received the ſacerdotal, Eliſha the prophetic, and David, Solomon, and others, the royal unction.

The prophecies in the Old Teſtament, which relate to the coming of the meſſiah are very numerous, ſome of which may be found in Gen. iii. 15. xlix. 10. Iſaiah vii. 14. Dan. ix. 25, *&c.*

The antient Hebrews being inſtructed by the prophets, had very clear notions of the meſſiah: theſe were changed by little and little, inſomuch that when Jeſus Chriſt appeared in Judea, they were in expectation of a temporal monarch, who ſhould free them from their ſubjection to the Romans. Hence they were greatly offended at the outward appearance, the humility, and ſeeming weakneſs of our Saviour; which prevented their acknowledging him to be the Chriſt they expected. The latter Jews have fallen into ſtill greater miſtakes, and formed to themſelves chimerical notions of the Meſſiah, utterly unknown to their forefathers. Some think he is already come, in the perſon of king Hezekiah: this opinion was firſt advanced by the famous Hillel, who lived before Chriſt. Others think the belief of the coming of the meſſiah, is no article of faith; and that he who denies this doctrine, makes but a ſmall breach in the law; he only lops off a branch from the tree, without hurting the root. But the greateſt part of the modern rabbins, according to Buxtorf, believe that the meſſiah is already come, but that he keeps himſelf concealed, and will not manifeſt himſelf becauſe of the ſins of the Jews. Some aſſign him the terreſtrial paradiſe for the place of his abode: others, the city of Rome, where, they ſay, he keeps himſelf concealed among the leprous and infirm, at the gate of the city, expecting Elias to come and manifeſt him to men. But the moſt general opinion of the Jews is, that the meſſiah is not yet come; and theſe are ſtrangely divided about the time and other circumſtances of his coming: different times have been fixed for his appearance, many of which are elapſed, and conſequently their hopes have been baffled; inſomuch that they have pronounced an anathema againſt all thoſe who ſhall pretend to calculate his coming. In order to reconcile thoſe prophecies which ſeem to oppoſe each other, ſome of the Jews have had recourſe to an hypotheſis of two meſſiahs, who are to ſucceed each other: one in a ſtate of humiliation, poverty, and ſuffering; the other, of glory, ſplendor, and power. This firſt is to proceed from the tribe of Joſeph, and the family of Euphraim; his father is to be called Huziel, and himſelf Nehemiah: the ſecond is to be born of the race of David, to rebuild the temple of Jeruſalem, and reign over the whole world. Our Saviour foretold that falſe Chriſts ſhould ariſe, who ſhould perform ſigns and wonders, by which even the elect ſhould be in danger of being deceived. The event has verified this prediction, and there has been a conſiderable number of theſe, from Barchochebas, who aroſe in the reign of the emperor Adrian, to Zabatai Tzevi, who appeared about the year 1666.

MESUA, in botany, a genus of the polyandria monogynia claſs of plants, the corolla whereof conſiſts of four large, hollow, rounded petals; the fruit is a coriaceous capſule, of a roundiſh, acuminated figure, formed of four valves, and marked with as many elate ſutures running longitudinally; the ſeeds are four, large and fleſhy, of a turbinated, triquetrous and obtuſe form.

METACARPUS, in anatomy, that part of the hand between the wriſt and the fingers. See HAND and WRIST.

The metacarpus conſiſts of four bones, which anſwer to the four fingers, whereof that which ſuſtains the fore-finger is the biggeſt and longeſt. They are all round and long, a little convex towards the back of the hand, and concave and plain towards the palm. They are hollow in the middle, and full of marrow: they touch one another only at their extremities, having ſpaces in the middle in which lie the muſculi interoſſei. See the article INTEROSSEUS.

In their upper end there is a ſinus, which receive

receives the bones of the wriſt; their lower extremity is round, and is received into the ſinus of the firſt bones of the fingers. See the article FINGER.

The inner part of the metacarpus is called the palm, and the other the back of the hand. See the article PALM.

For fractures and luxations of the metacarpus, ſee the articles HAND, WRIST, FRACTURE, and LUXATION.

METACARPUS, ſignifies, alſo, a ſmall, very fleſhy muſcle, ſituated obliquely between the large internal annular or tranſverſe ligament of the carpus, and the whole inſide of the fourth metacarpal bone.

It is fixed by a ſmall, ſhort tendon to the os orbiculare, and to the neighbouring part of the large ligament of the carpus. From thence its fibres run more or leſs obliquely, towards the inſide of the fourth metacarpal bone; the fibres of this muſcle are of unequal lengths, and extend all the way to the articulation of the firſt phalanx of the little finger with the fourth metacarpal bone, but have no manner of relation to that finger. This muſcle ſerves to turn the fourth bone of the metacarpus towards the thumb, and at the ſame time to increaſe the convexity of the back of the hand, which is called making Diogenes's cup. The fourth bone, thus moved, carries the third along with it, by reaſon of their connexion, which ſtill augments the hollow on one ſide, and the convexity on the other.

METAGITNION, μεταγειτνιων, in chronology, the ſecond month of the Athenian year, containing twenty-nine days, and anſwering to the latter part of our July, and beginning of Auguſt.

METALS, *metalla*, in natural hiſtory, are defined to be foſſile bodies, fuſible by fire, concreting again in the cold, and malleable, or diſtenſible and ductile under the hammer. Theſe are the diſtinguiſhing characters of thoſe bodies in their pure ſtate: but many of them are not found in this pure ſtate in the earth, being reduced by admixtures of ſulphur and other bodies to the ſtate of ore. See ORE.

The claſs of the metals, according to theſe characters, include ſix bodies, *viz.* gold, ſilver, copper, tin, iron, and lead. For the properties, preparations, uſes, and peculiar characters, *&c.* of each, ſee the articles GOLD, SILVER, *&c.*

The weight of the metals is one of their great diſtinguiſhing characters, from all other ſubſtances: and it ſerves alſo, by means of the hydroſtatical balance, by which their ſpecific gravities are accurately determined, to diſtinguiſh them even in mixture from one another, in a manner that no other means could ever come up to: the ſpecific gravity of each metal may be ſeen in the table of ſpecific gravities, under the article GRAVITY.

The chemiſts have divided the metals into two claſſes, the perfect and the imperfect. Gold and ſilver only are allowed to be of the firſt claſs, as loſing nothing of their weight, nor receiving any alteration in the fire; the other four, as they want this quality of reſiſting the force of the heat, they call imperfect: but this is thought to be a diſtinction not very obvious, nor eſſential. The learned Boerhaave, from his Hiſtory of Metals, draws the following corollaries: 1. That metals differ abſolutely from all other natural or artificial bodies hitherto diſcovered, ſince the lighteſt metal is more than double the weight of the heavieſt non-metalline body. 2. They therefore are greatly miſtaken, who expect, by any converſion of ſubſtance, to take metals out of bodies non metalline; ſince condenſation is the moſt difficult of all operations; and weight being the index of corporeal quantity, requires ſomething like a creative power to increaſe it. 3. True metals do not diſcover the affinity of their matter by any thing more evidently than by their reſemblance in point of weight. 4. Nothing therefore reſembles gold more nearly than quickſilver, with regard to the matter in both. 5. The other properties of metals, as fixity, colour, malleability, and ſimplicity, may probably be produced and changed with more eaſe than their weight. 6. Gold therefore conſiſts of a moſt pure ſimple matter, like mercury, fixed by another pure, ſimple, ſubtile principle, diffuſed through its minuteſt parts, and intimately uniting them to one another, and to itſelf. This the chemiſts mean, when they ſay it conſiſts of mercury and ſulphur. 7. The other metals conſiſt of the ſame principles, but together therewith have another light matter intermixed, which is different in the different metals, and is called earth; conſequently theſe are compoſed of three matters, to which in ſome may be added crude ſulphur. 8. The different metals are reſolvable, therefore, into different elements, both in reſpect of nature and number. 9. This reſolution may be effected by means of mercury, regenerat-

ing ſalts, or fire, but differently, according to the different metals. 10. It is a miſtake, therefore, to ſay that metals may be eaſily converted into one another, excepting with regard to the mercurial parts, and by firſt utterly deſtroying their form; and conſequently the quantity of gold procured from any other metal by tranſmutation, can only be in proportion to the quantity of mercury it before contained. 11. Nor does it appear that any beſides the ſix above-mentioned metals can be procured by art, how confidently ſoever Van Helmont may have aſſerted this of mercury fixed by the alkaheſt. 12. All the ſix metals, when fuſed by fire in clean veſſels, have the ſame appearance and perfectly reſemble mercury, both in reſpect of colour, denſity, the ſphericity of their drops, the attraction of their parts, their mobility and manner of running: hence, therefore, it ſeems to follow, that mercury is a metal fuſed by the ſmalleſt fire; that tin requires a greater degree of fire, and that if the atmoſphere were hot enough to fuſe it, it would be mercury, but mercury which ſmokes and caſts up a froth: that lead would alſo be mercury with the next degree of heat, but mercury with certain peculiar properties of frothing and penetrating veſſels: ſo ſilver and gold are mercury, which require a much greater degree of fire, and remain immutable therein: copper again is mercury, which melts in a much intenſer heat, but is changed withal: laſtly, iron becomes mercury in a degree of heat beyond any, though changeable thereby.

For the chemical character of metals, aſſaying metals, coppelling of metals, ſolution of metals by menſtruums, *&c.* ſee the articles CHARACTER, METALLURGY, ASSAYING, COPPELLING, MENSTRUUM, *&c.*

For the generation of metals by earthquakes. See the article EARTHQUAKE.

Prince's METAL, called alſo *Bath*-METAL, a kind of factitious metal, of a beautiful yellow, and diſpoſed to receive a fine poliſh luſtre, *&c.* It is prepared, according to Dr. Shaw, as follows: take ſix ounces of copper, melting it in a wind-furnace; add to it one ounce of zink; then ſtirring the whole well together, pour out the metal immediately. The copper and zink may be put into the crucible together, if firſt covered over with the black flux, which prevents the evolution of the zink, or preſerves its metalline form. See the article FLUX.

Bell-METAL. See the article BELL.

Homberg's METAL, an imitation of gold. See the article GOLD.

Semi-METALS, metallic foſſils, fuſible by fire, and not malleable in their pureſt ſtate.

Theſe are all, in their native ſtate, penetrated by, and intimately mixed with ſulphur, and other adventitious matter, and reduced to what are called ores.

Of this ſeries of foſſils there are only five bodies, all naturally comprehended in the ſame claſs, but each making a ſeparate and diſtinct genus: theſe are antimony, biſmuth, cobalt, zink, and quickſilver. For the characters, preparations, and uſes of each, ſee ANTIMONY, BISMUTH, COBALT, ZINK, and MERCURY.

METAL, in heraldry. There are two metals uſed in heraldry, by way of colours, *viz.* gold and ſilver, in blazon called *or* and *argent*.

In the common painting of arms theſe metals are repreſented by white and yellow, which are the natural colours of thoſe metals. In engraving, gold is expreſſed by dotting the coat, *&c.* all over; and ſilver, by leaving it quite blank.

It is a general rule in heraldry, never to place metal upon metal, nor colour upon colour; ſo that if the field be of one of the metals, the bearing muſt be of ſome colour; and if the field be of any colour, the bearing muſt be of one of the metals.

METALLIC, or METALLINE, an adjective applied to ſomething that bears a relation to metals. See METAL.

METALLURGY, *metallurgia*, according to Boerhaave, comprehends the whole art of preparing and working metals, from the glebe, or ore, to the utenſil; in which ſenſe, aſſaying, ſmelting, refining, ſmithery, gilding, *&c.* are only branches of metallurgy.

Dr. Shaw however reſtrains metallurgy to thoſe operations required to ſeparate metals from their ores, for the uſes of life. Theſe operations are of two kinds, or ſmaller and large; with regard to which the whole art of metallurgy may be divided into two parts, aſſaying and ſmelting. See ASSAYING, *&c.*

Dr. Cramer obſerves, that the art of aſſaying conſiſts in a well-made ſeparation of minerals, eſpecially metals, and in a diviſion of the ſeveral conſtituent parts of them

them from each other, in order that the quantity and quality of each in particular may be known: it is plain that thoſe operations which belong to the general claſs of ſolution, appertain ſtrictly and primarily to this; and that the others which are performed by the aſſayer, are only ſecondary or auxiliary operations. But there is hardly any chemical operation which is not ſometimes neceſſary to be performed in the art of aſſaying: there are many, on the contrary, which are peculiar to aſſaying alone; therefore we ſhall here give a general view of thoſe which properly belong to it; or of thoſe which, though taken from chemiſtry at large, are nevertheleſs uſed by aſſayers; only firſt obſerving that every primary docimaſtical operation may, on account of its effects, be called ſolution, ſince, in every operation, the menſtrua, among which, I think, the air and fire have a right to be claſſed, effect a ſolution, by interpoſing themſelves between the parts of the objects to be changed. See the articles MENSTRUUM and FLUX.

Now a docimaſtical ſolution is either

- Dry
  - Fuſion. (These may be called almoſt univerſal, becauſe they diſſolve either the whole maſs, or, at leaſt, by much the greater part of the ſubject in hand.)
  - Vitrification.
  - Scorification.
  - Coppelling.
  - Reduction.
  - Amalgamation.
  - Sublimation.
  - Cæmentation.
  - Roaſting. (We may call theſe partial, as they all diſſolve but one part of the ſubject in hand.)
  - Calcination.
  - Eliquation by fuſion.
- or
- Moiſt (All theſe are partial, and ſeparate ſome parts from the others.)
  - Elutriation.
  - Edulcoration.
  - Quartation.
  - Moiſt precipitation.

An account of each of theſe may be found under their proper heads.

Dr. Shaw, after mentioning the manner of extracting metal from the ore, by aſſaying and ſmelting, gives ſeveral axioms and canons of metallurgy, among which are the following: that the art of aſſaying is hitherto imperfect, but capable of receiving conſiderable improvement from chemical and mechanical knowledge: that the troubleſome and expenſive method of ſeparating gold from ſilver by quartation, may be advantageouſly ſuperſeded, or ſet aſide, by means of fuſion, or a dexterous management of the fire: that gold and ſilver are ſeldom rendered abſolutely pure, or ſeparated from all other kinds of metallic or mineral matters; and that to purify them in this manner requires the uſe of better methods than thoſe commonly uſed for that purpoſe; though the thing itſelf is ſtill performable by art and a ſuitable proceſs: that ſulphur has different effects upon different metals; which effects being well noted, rules of practice might thence be derived, for the farther improvement of metallurgy: that the ignobler metals are ſeparable from each other by the application of proper degrees of heat, ſo as to make the more fuſible melt away from the leſs fuſible, at leaſt with the aſſiſtance of lead: that all metals are reducible by burning or calcination, to terreſtrial powders, which, by being melted with any inflammable matter, aſſume their metalline form: that the great enemies to ductility, or the true metallic nature, are ſulphur, cobalt, and things compounded thereof; but that all unctuous or inflammable bodies are friendly to metals, and promote or reſtore their ductility, when melted therewith: that copper may be made to approach to the colour of gold, and at the ſame time not loſe, but increaſe its ductility, by being amalgamated with, and diſtilled from quickſilver; and that probably many artificial or compound metals are diſcoverable by mixing various metalline and mineral bodies together, ſo as greatly to enrich and improve the art of metallurgy: that, in general, ores are no more than a natural looſe mixture of metallic matter with earthy and ſulphureous ones; whence artificial ores may be readily made by calcining a metal with ſulphur, and mixing it with earth, ſo as with heat to form ſolid lumps of ore, reſembling

theſe

thoſe dug out of the mines: and that numerous experiments remain to be made, and facts of nature or obſervations to be regiſtered, or the relations of bodies to be found, before this uſeful ſubject of metallurgy can be brought to perfection.

METAMORPHOSIS, in general, denotes the changing of ſomething into a different form; in which ſenſe it includes the transformation of inſects, as well as the mythological changes related by the antient poets.

Mythological metamorphoſes were held to be of two kinds, apparent and real: thus that of Jupiter into a bull, was only apparent; whereas that of Lycaon into a wolf, was ſuppoſed to be real.

Moſt of the antient metamorphoſes include ſome allegorical meaning, relating either to phyſics or morality: ſome authors are even of opinion that a great part of the antient philoſophy is couched under them; and lord Bacon and Dr. Hook have attempted to unriddle ſeveral of them.

Ovid's Metamorphoſes make an excellent ſyſtem of morality: the ſtories of Deucalion and Pyrrha, of Phaëton, of Baucis and Philemon, of Minos and Scylla, *&c.* being excellent leſſons in this way.

METAPHOR, in rhetoric, a trope, by which we put a ſtrange word for a proper word, by reaſon of its reſemblance to it; or it may be defined, a ſimile or compariſon intended to enforce and illuſtrate the thing we ſpeak of, without the ſigns or forms of compariſon. Thus, if we ſay, *God is* a ſhield *to good men*, it is a metaphor, becauſe the ſign of compariſon is not expreſſed, though the reſemblance which is the foundation of the trope, is plain; for as a ſhield guards him that bears it, againſt the attacks of an enemy, ſo the providence and favour of God protects good men from malice and misfortunes: but if the ſentence be put thus, *God is* as a ſhield *to good men*, then it becomes a ſimile or compariſon.

A metaphor may be formed from any thing that is the object of any of our ſenſes; but that is generally the moſt agreeable and ſprightly, which ariſes from the ſenſe of ſeeing; becauſe of all the ſenſes, ſeeing is the moſt perfect and comprehenſive, the moſt unwearied and inquiſitive, the moſt deſirable and delightful.

If an author is obliged to give a large account of things, plain and in the road of common obſervation, he ſhould raiſe and enoble them by ſtrong and graceful metaphors. This rule Tully has obſerved in his deſcription of the ſeveral parts of this habitable globe, in his book on the Nature of the Gods. So has Virgil, in his Georgics, where he has made his meaneſt and coarſeſt ſubjects fine and admirable, by his judicious uſe of metaphors; in his perfect lines, the little affairs of ſhepherds and farmers appear with dignity; his deſcriptions make the country a paradiſe, and his touches, as a noble writer expreſſes it, turns every thing into gold. Thoſe are admirable and beautiful metaphors, in which the properties of rational creatures are applied to animals, and thoſe of animals to plants and trees; this way of treating a ſubject gives life and beauty to the whole creation. But we receive the ſtrongeſt pleaſure from thoſe bold and comprehenſive metaphors in which, beſides the illuſtration of the ſubject they are intended to raiſe and improve, convey to us a freſh and lively image.

Mr. Du Boſs juſtly obſerves, that metaphors, and all the other figures of rhetoric, ought to be adapted to the circumſtances and ſituation of thoſe for whoſe uſe they are deſigned, and that we loſe much of the beauty of thoſe metaphors which allude to the refreſhing ſhade afforded from the beams of a ſcorching ſun; and adds, that had Virgil wrote for the cold northern nations, inſtead of drawing his metaphors from a brook whoſe cool ſtreams quench the traveller's thirſt, or from a grove ſpreading a delightful ſhade on the brink of a fountain, he would have taken them from a good warm ſtove; from the pleaſure a man who is almoſt ſtiff with cold, feels upon approaching the fire, or from the ſlower, but more agreeable, ſenſation he finds on putting on a coat lined with good comfortable fur.

METAPHRASE, uſually ſignifies ſomething more than either a tranſlation or a paraphraſe: according to Baillet, a metaphraſt implies a tranſlator, gloſſator, and interpolator altogether.

METAPHYSICS, *metaphyſica tranſnaturalis*, ontology, or ontoſophy, a ſcience that treats of being, as ſuch, in the abſtract.

All other ſciences have a neceſſary dependence on this, for it ſupplies them with a foundation and a method to proceed upon, without which, our knowledge of any ſubject muſt be very confuſed and imper-

fect

fect. This was probably the reaſon that made Ariſtotle ſtyle this ſcience the true beginning of philoſophy, and the moſt noble of all the ſciences. As it is wholly converſant in the acts of the underſtanding it raiſes itſelf above the verge of ſenſe and matter, by its abſtracted views. The quantity of bodies it refers to the conſideration of geometry, and their ſenſible qualities to natural philoſophy, applying itſelf only to beings ſeparated from their individual ſingularity, ſuch as ſubſtances, accidents, relations, and whatever elſe may be conceived abſtractedly from matter; but particularly beings purely ſpiritual, ſuch as God, angels, and the ſoul of man: hence Ariſtotle terms it natural theology. The end of this ſcience is the ſearch of pure and abſtracted truth. It caſts a light upon all the objects of thought and meditation, by ranging every being with all the abſolute and relative perfections and properties, modes and attendants of it, in proper ranks or claſſes; and thereby it diſcovers the various relations of things to each other, and what are their general or ſpecial differences from each other; wherein a great part of human knowledge conſiſts: and by this means, it greatly conduces to inſtruct us in method, or the diſpoſition of putting every thing in its proper rank and claſs of being, attributes or actions; and hence its proper affinity with logic. See METHOD.

This ſcience, however it may ſeem to have been laboured, is yet capable of being farther improved: but it has many obſtacles in its way. If we are ſhort-ſighted in phyſical matters, which are nearer our ſenſe, and in a manner within our view, how much more muſt we be bewildered in our ſearch after ſpiritual abſtracted truths, in the conſideration of univerſals, and of things of a tranſcendant nature, ſuch as fall properly under the conſideration of metaphyſics. This ſcience proceeds in unfrequented and almoſt unknown paths, containing very few doctrines of allowed and eſtabliſhed certainty; few principles in which men are univerſally agreed; ſcarce any juſt definition, any exact and complete diviſion; and conſequently affords large matter for doubts and diſputes. For, though metaphyſical truths may be certain enough in their own nature, yet they are not uſually ſo to us; but being abſtruſe things, and lying deep and remote from ſenſe, it is not every one that is capable of underſtanding them, and there are fewer yet who underſtand their true uſe. Ariſtotle ſeems to have been the firſt founder and inventor of this abſtracted method of reaſoning, and the conſideration of immaterial beings: for his predeceſſors in philoſophy, ſcarce delivered any thing that was good and ſolid upon theſe ſubjects; and, indeed, antiquity affords nothing upon it compoſed with ſo much ſtrength of reaſon as Cicero's book of the Nature of the Gods. We have but few modern works of this kind, the chief of which are Deſcartes, Mallebranch, Dr. Willis, Locke, Hutchinſon, S' Graveſande, Dr. Moor, &c.

METAPLASMUS, in grammar, a tranſmutation or change made in a word, by adding, retrenching, or altering a letter or ſyllable thereof.

The ſeveral ſpecies of this figure are ten in number, *viz.* proſtheſis, epentheſis, paragoge, diæreſis, aphæreſis, ſyncope, apocope, craſis, metatheſis and antitheſis; four of which augment the letters or ſyllables of a word, four retrench them, and two alter them. See the articles, PROSTHESIS, EPENTHESIS, &c.

METASTASIS, in medicine, a tranſpoſition or ſettlement of ſome humour or diſeaſe, on ſome other part; and ſometimes it ſignifies ſuch an alteration of a diſeaſe, as is ſucceeded by a ſolution.

METATARSUS, in anatomy, a fleſhy maſs lying under the ſole of the foot. See the article FOOT.

It is fixed by one end in the fore part of the great tuberoſity of the os calcis, and running forward from thence, it terminates in a kind of ſhort tendon, which is fixed in the tuberoſity and poſterior part of the lower ſide of the fifth bone of the metatarſus.

Metatarſus is alſo the aſſemblage of ſmall bones articulated to the tarſus at one end, and to the toes at the other.

METATHESIS, in grammar, a ſpecies of the metaplaſmus; being a figure whereby the letters or ſyllables of a word are tranſpoſed, or ſhifted out of their uſual ſituation, as piſtris for priſtis, lybia for libya, &c. See METAPLASMUS.

This word is, by phyſicians, uſed with reſpect to morbific cauſes; which, when they cannot be evacuated, are removed to places where they are leſs injurious.

METEMPSYCHOSIS, the doctrine of tranſmigration, which ſuppoſes that human ſouls, upon their leaving the body, become the ſouls of ſuch kind of brutes as they moſt reſemble in their manners. This was the doctrine of Pythagoras and his

his followers, who held that the ſouls of vicious men were impriſoned in the bodies of miſerable beaſts, there to do pennance for ſeveral ages, at the expiration whereof they returned again to animate men; but if they had lived virtuouſly, ſome happier brute, or even a human creature, was to be their lot. What led Pythagoras into this opinion was the perſuaſion he had that the ſoul was not of a periſhable nature; whence he concluded, that it muſt move into ſome other body upon its abandoning this. Lucan thinks this doctrine was contrived to mitigate the apprehenſion of death, by perſuading men that they only changed their lodgings, and ceaſed to live only to begin a new life. Reuchlin denies this doctrine, and maintains, that the metempſychoſis of Pythagoras implied nothing more than a ſimilitude of manners and deſires formerly exiſting in ſome perſon deceaſed, and now reviving in another alive. Pythagoras is ſaid to have borrowed the notion of a metempſychoſis from the Egyptians; others ſay from the antient brachmans. It is ſtill retained among the antient banians, and other idolaters of India and China, and makes the principal foundation of their religion. Many of the modern Jews are ſaid to eſpouſe this doctrine, and to ſupport their opinion quote theſe words of Job, "Lo all theſe things "worketh God oftentimes with man "(in hebrew, *and thrice)* to bring back "his ſoul from the pit to be enlightened "with the light of the living." It is certain, that at the time of Jeſus Chriſt this opinion was very common among the Jews: this appears in the Goſpel, when they ſay that ſome thought Jeſus Chriſt to be John the Baptiſt, others Elias, others Jeremiah, *&c.*

METEMTOSIS, a term in chronology, expreſſing the ſolar equation, neceſſary to prevent the new moon from happening a day too late, by which it is oppoſed to proemptoſis, which ſignifies the lunar equation neceſſary to prevent the new moon from happening a day too ſoon. The new moon's running a little backward, that is, coming a day too ſoon, at the end of three hundred twelve years and a half; by the proemptoſis a day is added every three hundred years, and another every two thouſand four hundred years. On the other hand, by the metemptoſis, a biſſextile is ſuppreſſed every one hundred and thirty-four years; that is, three times in four hundred years. Theſe alterations are never made but at the end of each century; that period being very remarkable, and rendering the practice of the calendar eaſy.

There are three rules for making this addition or ſuppreſſion of the biſſextile day, and by conſequence for changing the index of the epacts. 1. When there is a metemptoſis without a proemptoſis, the next following, or lower index, muſt be taken. 2. When there is a proemptoſis without a metemptoſis, the next preceding, or ſuperior index is to be taken. 3. When there are both a metemptoſis and proemptoſis, or when there is neither the one nor the other, the ſame index is preſerved.

METEOR, in phyſiology, an imperfect, changeable, and mixt body, or the reſemblance of a body appearing in the atmoſphere, and formed by the action of the heavenly bodies, out of the common elements.

Meteors are of three kinds, fiery, airy and watery. Fiery meteors conſiſt of a fat ſulphureous ſmoke ſet on fire; ſuch as lightning, thunder, falling ſtars, draco volans, the ignis fatuus, and other phænomena, appearing in the air. Airy meteors conſiſt of flatulent and ſpirituous exhalations, ſuch as winds. *&c.* Watery meteors are compoſed of vapours, or watery particles, variouſly modified by heat and cold, ſuch as clouds, rain, hail, ſnow and dew. See the articles LIGHTENING, WIND, HAIL, *&c.*

Dr. Woodward ſuppoſes that the matter of which many of the meteors are formed, is in a great meaſure of a mineral nature; and that the mineral particles contained in the ſtrata of the earth, are raiſed by the ſubterraneous heat, together with the vapours aſcending from the abyſs and pervading thoſe ſtrata, eſpecially at ſuch times as the ſun's heat is ſufficient to penetrate the exterior parts of the earth, and to make room for their eſcape into the atmoſphere. Theſe ſulphureous, nitrous, and other active and volatile mineral particles, form various meteors, particularly thunder, lightning, and the other phænomena of a fiery nature. See EXHALATIONS, DAMPS, *&c.*

METHEGLIN, a drink prepared of honey, one of the moſt pleaſant and general drinks the northern parts of Europe afford. It is, according to Baily, made as follows: put as much new honey, naturally running from the comb, into ſpring water, as that, when the honey is thoroughly

roughly diſſolved, an egg will not ſink to the bottom, but be juſt ſuſpended in it. Then boil the liquor for an hour or more, till ſuch time as the egg ſwim above the liquor; then take it off the fire, and let it cool. When very cool, next morning, it may be barrelled up; and adding to it half an ounce of ginger, as much of cloves, as much of mace, and a quarter of an ounce of cinnamon, all groſly pounded, a ſpoonful of yeaſt may be added alſo at the bung to increaſe its fermentation. When it has done working, it may be cloſely ſtopped up, and after it has ſtood a month it may be drawn off into bottles.

Metheglin, on its importation, pays a duty of 7 s. $8\frac{40}{100}$ d. the hogſhead: and draws back, on exportation, 6 s. 9 d.

METHOD, μεθοδος, in logic, &c. the arrangement of our ideas in ſuch a regular order, that their mutual connection and dependence may be readily comprehended. See IDEA and KNOWLEDGE.

The doctrine of method makes one of the ſubdiviſions of logic, which is always placed laſt in order, becauſe it ſuppoſes a previous exerciſe of our other faculties of perception, judgment and reaſoning, and ſome progreſs made in knowledge before we can exert it in any extenſive degree. See the articles PERCEPTION, INTUITION, JUDGMENT, and REASONING.

The proper buſineſs, therefore, of method, is to diſtribute our ideas into various claſſes, combining into a regular ſyſtem whatever relates to one and the ſame ſubject, to aſcertain the various diviſions of human knowledge, and ſo to connect the parts in every branch that they may ſeem to grow one out of another, and form a regular body of ſcience, riſing firſt from principles, and proceeding by an orderly concatenation of truths. In this view of things it is plain, that we muſt be before hand well acquainted with the truths we are to combine together; otherwiſe we could neither diſcern their ſeveral connections and relations, nor ſo diſpoſe of them as their mutual dependence may require.

But it often happens, that the underſtanding is employed, not in the arrangement and compoſition of known truths, but in the ſearch and diſcovery of ſuch as are unknown: and here the manner of proceeding is very different, inaſmuch as we aſſemble at once our whole ſtock of knowledge relating to any ſubject, and after a general ſurvey of things, begin with examining them ſeparately and by parts; and when, by ſuch a ſcrutiny, we have thoroughly informed ourſelves of the nature and contexture of each, we then compare them together in order to judge of their mutual action and influence.

Hence it appears, that in diſpoſing and putting together our thoughts, either for our own uſe, that the diſcoveries we have made may at all times lie open to the review of the mind, or where we mean to unfold and communicate theſe diſcoveries to others, there are two methods of proceeding equally within our choice: for we may ſo propoſe the truths relating to any part of knowledge, as they preſented themſelves to the mind in the manner of inveſtigation, carrying on the ſeries of truths in a reverſe order, until they at laſt terminate in firſt principles; or beginning with firſt principles, we may take the contrary way, and from them deduce, by a direct train of reaſoning, the ſeveral propoſitions we want to eſtabliſh. The former of theſe methods is termed, by logicians, the analytic method, or the method of reſolution, in as much as it traces things backward to their ſource, and reſolves knowledge into its firſt and original principles. The latter conſtitutes what is called the ſynthetic method, or the method of compoſition; becauſe here we proceed by gathering together the ſeveral ſcattered parts of knowledge, and combining them into one whole or ſyſtem, in ſuch a manner that the underſtanding is enabled diſtinctly to follow truth through all her different ſtages and gradations.

There is this farther to be taken notice of in relation to theſe two kinds of method, that the analytic has alſo obtained the name of the method of invention; becauſe it obſerves the order in which our thoughts ſucceed one another in the invention or diſcovery of truth: whereas the ſynthetic is often denominated the method of doctrine or inſtruction, inaſmuch as in laying our thoughts before others, we generally chooſe to proceed in this manner, deducing them from their firſt principles. For we are to obſerve, that although there is great pleaſure in purſuing truth in the method of inveſtigation, becauſe it places us in the condition of the inventor, and ſhews the particular train of thinking by which he arrived at his diſcovery, yet it is not ſo well accommodated to the purpoſes of evidence and conviction, ſince, at our firſt ſetting out, we are commonly unable to divine where

the analyſis will lead us; and even after light begins to break in upon us, we are ſtill obliged to many reviews, and a frequent compariſon of the ſeveral ſteps of the inveſtigation among themſelves: nay, when we have unravelled the whole, and reached the very foundation on which our diſcoveries ſtand, all our certainty, in regard to their truth, will be found, in a great meaſure, to ariſe from that connection we are now able to diſcern between them and firſt principles, taken in the order of compoſition. But in the ſynthetic method of diſpoſing our thoughts the caſe is quite different: for as we here begin with intuitive truths, and advance by regular deductions from them, every ſtep of the procedure brings evidence and conviction along with it; ſo that in our progreſs from one part of knowledge to another, we have always a clear perception of the ground on which our aſſent reſts. In communicating, therefore, our diſcoveries to others, this method is apparently to be choſen, as it wonderfully improves and enlightens the underſtanding, and leads to an immediate perception of truth: and hence it is called the method of ſcience, becauſe all the parts of knowledge, which properly bear the name of ſciences, are and ought to be delivered in it. See the article SCIENCE.

In order to proceed ſucceſsfully in the analytic method, we muſt endeavour, as much as poſſible, to enlarge the capacity of the mind, by accuſtoming it to wide and comprehenſive views of things; we muſt alſo habituate ourſelves to a ſtrong and unſhaken attention, which carefully diſtinguiſhes all the circumſtances that come in our way, and lets nothing material ſlip its notice; in fine, we muſt furniſh ourſelves with an ample variety of intermediate ideas, and be much in the exerciſe of ſingling them out and applying them for the diſcovery of truth. Theſe preparatory qualifications obtained, what further depends upon us lies chiefly in the manner of combining our perceptions, and claſſing them with addreſs; and here the advantages of a proper notation are very great. See NOTATION, ANALYSIS, &c.

With reſpect to the ſynthetic or ſcientifical method, the great ſecret lies in ſo managing and conducting our thoughts, as that their ſeveral relations may be laid open to the view of the underſtanding, and become the unavoidable objects of our perception. In order to this, we muſt make it our firſt care diſtinctly to frame and ſettle the idea, about which our enquiries are to be employed: for as the relations ſubſiſting between them can no otherwiſe be diſcerned, than by comparing them one with another; and as this compariſon neceſſarily ſuppoſes, that the ideas themſelves are actually in the mind, and at that very time under our immediate inſpection; it plainly follows, that all ſcience muſt begin with fixing and aſcertaining thoſe ideas. See IDEA. By this means alone, are theſe our more intricate notions kept diſtinct and invariable; inſomuch, that in all our ſeveral views of them, they ever have the ſame appearance, and exhibit the ſame habitudes and reſpects. And here, properly ſpeaking, the art of knowledge begins: for although we find it eaſy enough to bound and ſettle our ideas, where they conſiſt of but a few perceptions, yet when they grow to be very complicated, it often requires great addreſs and management to throw them into ſuch views as may prevent the confuſion that is apt to ariſe from the joint conſideration of a multiplicity of objects. To remedy this inconvenience, the ſynthetic method teaches us to diſpoſe our perceptions into claſſes, ſerieſes and genera: and as in advancing from one degree to another, we are always to proportion the number of notices united, to the ſtrength and capacity of the mind, it is apparent, that by ſuch a procedure, the ideas will be thoroughly aſcertained in every ſtep, and however large and bulky, lie nevertheleſs fairly within our graſp. This obviouſly accounts for that wonderful clearneſs of apprehenſion which we often experience within ourſelves, even in regard to the moſt complicated conceptions: for though the multitude of parts, in many caſes be great, almoſt beyond belief, yet if they have all previouſly been formed into ſeparate claſſes and ſubdiviſions, all diſtinctly ſettled in the underſtanding, we find it eaſy by ſuch a ſeries of ſteps to riſe to any idea, how complex ſoever, and with a ſingle glance of thought embrace it in its full extent. See the article CLASS, GENUS, &c.

But it is not enough that we barely form ideas in our minds; we muſt alſo contrive a way not only to make them ſtable and permanent, ſo as to be able to recollect them with eaſe and certainty, but alſo

unfo

unfold them to others; which is beſt done by well defined words. See the articles WORD and DEFINITION.

This foundation being laid, the communication of our complex conceptions, by definitions, becomes both eaſy and certain: for ſince the ideas themſelves are formed into different orders, and theſe orders ariſe continually out of thoſe combinations that conſtitute the claſſes next below them, ſo the definitions correſponding to theſe different orders, gradually take in the terms by which the ſeveral inferior diviſions are regularly and ſucceſſively expreſſed. In ſuch a ſeries of deſcriptions, it is evident, at firſt ſight, that nothing can be obſcure and unintelligible. For as it begins with the names of ſimple ideas, whoſe meaning is ſuppoſed to be known; and as in every order of definitions, ſuch terms only occur as have been previouſly explained in the preceding diſtributions; by advancing regularly from one to another, we gradually furniſh ourſelves with whatever is neceſſary towards a diſtinct conception of all that is laid before us. Nor is it a ſmall advantage attending this diſpoſition, that the ſeveral ideas deſcribed are hereby excited in the underſtanding, in the very order and manner in which they are framed by a mind, advanced uniformly from ſimple to the moſt complicated notions. Hence we ſee diſtinctly the various dependence of things, and being put into that very train of thinking, which leads directly to ſcience and certainty, are drawn inſenſibly to intereſt ourſelves in the purſuit; inſomuch that while in fact we do no more than follow a guide and conductor, we can yet hardly forbear fancying ourſelves engaged in the actual exercite of deducing one part of knowledge from another.

When we have thus fixed and aſcertained our ideas, and diſtinctly exhibited them in definitions, we then enter upon the important taſk of tracing their ſeveral relations; in order to which, we ſet about comparing them among themſelves, and viewing them in a variety of lights: and here it happens, that ſome relations forwardly offer themſelves to the notice of the underſtanding, and become the neceſſary objects of perception, upon the very firſt application of our ideas to one another; and, conſequently, conſtitute our primary and intuitive judgments, being attended with the higheſt degree of evidence, and producing abſolute certainty in the mind. But in many caſes, the connection or repugnance between our ideas, even when real, comes not within our immediate view, but requires ſearch and examination to diſcover it; and hence ariſes the neceſſity of reaſoning and demonſtration. See the articles REASONING, DEMONSTRATION, &c.

But what is particularly elegant and happy in the method above explained, we hereby ſee knowledge riſing out of its firſt elements, and diſcern diſtinctly how thoſe elements are interwoven, in order to the erecting a goodly ſuperſtructure of truth. Experience furniſhes us with ſimple ideas and their names, which are the primary materials of thinking and communication. Definitions teach how to unite and bind theſe ideas together, ſo as to form them into complex notions of various orders and degrees. Intuitive truths conſtitute the fundamental principles of all knowledge, and the ultimate ground of certainty. Demonſtrations link known truths together, in ſuch a manner, that they neceſſarily lead to others unknown. Thus are we gradually led from ſimple ideas, through all the windings and labyrinths of truth, until we at length reach the moſt exalted diſcoveries of human reaſon. It is true, the method here laid down, hath hitherto been obſerved ſtrictly, only among mathematicians; and is therefore, by many, thought to be peculiar to number and magnitude. But it appears evidently from what we have ſaid above, that it may be equally applied in all ſuch other parts of knowledge as regard the abſtract ideas of the mind, and the relations ſubſiſting between them.

As to the method to be obſerved in judging of the hiſtorical and experimental parts of our knowledge, ſee HISTORY and EXPERIMENTAL PHILOSOPHY.

The methods alſo of fluxions, of the differential calculus, of tangents, of finding the maximum, &c. may be ſeen under the articles FLUXION, CALCULUS DIFFERENTIALIS, &c.

METHODISTS, a name at firſt given to a ſociety of religious young men at Oxford, and now applied to all thoſe who adhere to the doctrine of the church of England as taught by Whitefield, Weſley, &c. They are ſaid to be, in general, plain well-meaning people, who do not diſſent from the eſtabliſhed church; but profeſs to live with great purity, according to her articles. At their firſt appear-

ance their teachers were charged, in the heat of their zeal, with ſeveral irregularities, and many expreſſions in their preaching which were not altogether unexceptionable; but as the civil government, with a moderation and wiſdom peculiar to the preſent time, thought fit to overlook their behaviour, they have ſince honeſtly acknowledged wherein they were miſtaken; and, in conſequence of the perfect liberty of conſcience they enjoy, have ſubſided into a more regular and peaceable conduct, agreeable to the genuine ſpirit of chriſtianity.

METHODISTS, *Methodici*, is alſo an appellation given a ſect of antient phyſicians, who reduced the whole healing art to a few common principles or appearances. See the article PHYSICIANS.

They were alſo called Theſſalici, as being the followers of Theſſalus. Galen ſtrenuouſly oppoſed them, and ſcrupled not to aſſert that the methodical hereſy ruined every thing good in the art of phyſic.

METHODISTS, among botaniſts, Linnæus defines to be thoſe perſons who have attempted the ſtudy of botany upon certain principles, and have beſtowed their labours upon the diſpoſition and arrangement of plants, and allotting them proper and diſtinctive names.

METOCHE, in antient architecture, a term uſed by Vitruvius to ſignify the ſpace or interval between the dentils. See the article DENTIL.

METONIC CYCLE, in chronology, the ſame with the cycle of the moon. See the article CYCLE.

METONYMY, in rhetoric, is a trope in which one name is put for another, on account of the near relation there is between them. By this trope any of the moſt ſignificant circumſtances of a thing are put for the thing itſelf. The metonymy is uſed with moſt advantage in the following caſes. 1. When the narration ſtands for the action, and what the poet or hiſtorian deſcribes, he is ſaid to do; which is a lively manner of expreſſion, exceeding the common, as much as action goes beyond deſcription, or life excels painting. 2. When the name of any relation is put for the duty it requires, and the benevolence and tenderneſs that may be expected from it. Thus Anacreon ſays, that thro' money there is no longer any ſuch thing as brethren or parents in the world. 3. When the word which is uſed for a proper name, is either taken from the perſon's country, family, profeſſion, perſonal circumſtance, or reſemblance to ſome other; thus, as Sardanapalus was a monſter of debauchery, and Nero of cruelty, to call a very debauched perſon a Sardanapalus, and a cruel one Nero, brands them much deeper than to call one debauched, and the other cruel.

METOPE, *metopa*, in architecture, is the interval, or ſquare ſpace between the triglyphs of the doric frieze, which among the antients uſed to be painted or adorned with carved work, repreſenting the heads of oxen, or utenſils uſed in ſacrifices.

Mr. Le Clerc ſays, that the beauty of metopes conſiſts in their regularity, that is, in their appearing as perfect ſquares. He alſo obſerves, that when the triglyphs and metopes follow each other regularly, the columns muſt ſtand one by one, except thoſe of the inner angles, which ought always to be accompanied with two others, one on each ſide; from which the reſt of the columns may be placed at equal diſtances from each other.

Semi-METOPE, in architecture, is a ſpace in the corner of the doric frieze, ſomewhat leſs than half a metope.

METOPOSCOPY, the pretended art of knowing a perſon's diſpoſitions and manners, by viewing the traces and lines in the face. Ciro Spontoni, who has wrote expreſsly on metopoſcopy, ſays, that ſeven lines are examined in the forehead, and that each line is conſidered as having its particular planet: the firſt is the line of Saturn, the ſecond of Jupiter, the third of Mars, &c. Metopoſcopy is only a branch of phyſiognomy, which founds its conjectures on all the parts of the body. See PHYSIOGNOMONICS.

METRE, *μετρια*, in poetry, a ſyſtem of feet of a juſt length. See NUMBERS.

The different metres in poetry, are the different manners of ordering and combining the quantities, or the long and ſhort ſyllables; thus hexameter, pentameter, iambic, ſapphic verſes, &c. conſiſt of different metres, or meaſures. See HEXAMETER, PENTAMETER, &c.

In engliſh verſes, the metres are extremely various and arbitrary, every poet being at liberty to introduce any new form that he pleaſes. The moſt uſual are the heroic, generally conſiſting of five long and five ſhort ſyllables, and verſes of four feet, and of three feet, and a cæ-

ſura

ſura, or ſingle ſyllable. See the articles SYLLABLE and CÆSURA.

The antients, by variouſly combining and tranſpoſing their quantities, made a vaſt variety of different meaſures, by forming ſpondees, &c. of different feet. See the article FOOT.

METRETES, an antient meaſure of capacity, containing a little more than nine gallons.

METRICAL, ſomething relating to metre. See the article METRE.

METROCOMIA, in church-hiſtory, a borough, or village, which had other villages under its juriſdiction; being the ſame among villages, that a metropolis is among cities. See the following article.

METROPOLIS, the capital or principal city of a country or province.

The term metropolis is alſo applied to archiepiſcopal churches, and ſometimes to the principal or mother church of a city. The Roman empire having been divided into thirteen dioceſes, and one hundred and twenty provinces, each dioceſe and each province had its metropolis, or capital city, where the proconſul had his reſidence. To this civil diviſion, the eccleſiaſtical was afterwards adapted, and the biſhop of the capital city had the direction of affairs, and the preheminence over all the biſhops of the province. His reſidence in the metropolis gave him the title of metropolitan. This erection of metropolitans is referred to the end of the third century, and was confirmed by the council of Nice. A metropolitan has the privilege of ordaining his ſuffragans; and appeals from ſentences paſſed by the ſuffragans are preferred to the metropolitan.

METROPOLITAN. See the article METROPOLIS.

METZ, a city of Germany, in the dutchy of Lorrain, capital of the biſhopric of Metz, ſituated thirty miles north of Nancy.

MEVAT, a province of India in Aſia, north of Bengal, having the river Ganges on the weſt.

MEULUN, a town of France, ſituated on the river Seyne, fifteen miles north-weſt of Paris.

MEURS, a town of Germany, in the circle of Weſtphalia, and dutchy of Cleve, ſituated on the river Rhine, fifteen miles north of Duſſeldorp.

MEW, a place where a hawk is ſet, during the time ſhe raiſes her feathers.

MEWING, the falling off, or change of hair, feathers, ſkin, horns, or other parts of animals, which happens in ſome annually, in others only at certain ſtages of their lives: but the generality of beaſts mew in the ſpring. An old hart caſts his horns ſooner than a young one, which is commonly in the months of February and March, after which they begin to button in March or April; and as the ſun grows ſtrong, and the ſeaſon of the year puts forth the fruits of the earth, ſo their heads grow, and are ſummed full by the middle of June. It is to be obſerved, that if a hart be gelt before he has a head, he will never have any, and if he be gelt after he has a head, he will never caſt his horns; again, if he be gelt when he has a velvet-head, it will always be ſo, without fraying, or burniſhing.

MEXICO, the metropolis of New Spain, at preſent, and formerly of the empire of Mexico, ſituated in weſt long. 103°, north lat. 20°.

This province of New Spain in America, is now divided into Old and New Mexico.

Old MEXICO, ſituated between 83 and 116 degrees of weſt long. and between 8 and 28° north lat. is bounded by New Mexico, or Granada, on the north; by the gulph of Mexico on the north-eaſt; by Terra-firma on the ſouth-eaſt; and by the Pacific Ocean on the ſouth-weſt.

New MEXICO, including California, ſituated between 100 and 140 degrees of weſt long, and between the Tropic of Cancer and 48 degrees of north lat. is bounded by unknown lands on the north; by Florida on the eaſt; by Old Mexico on the ſouth; and by the Pacific Ocean on the weſt.

MEZIERES, a town of France, in the Province of Champaign, ſituated on the river Maes, in eaſt longitude 4°, latitude 49° 55′.

MEZZOTINTO, a particular manner of repreſenting figures on copper, ſo as to form prints in imitation of painting in indian ink.

The manner of making mezzotintos is very different from all other kinds of engraving and etching, ſince inſtead of forming the figures with lines and ſcratches made with the point of a graver, or by means of aqua fortis, they are wholly formed by ſcraping and burniſhing. Mezzotintos are made in the following manner: take a well-poliſhed copper-plate, and beginning at the corner, rake or fur-

row

row the ſurface all over with a knife or inſtrument made for the purpoſe, firſt one way, and then the other, till the whole is of a regular roughneſs, without the leaſt ſmooth part to be ſeen; in which ſtate, if a paper was to be worked off from it at the copper-plate preſs it would be all over black. When this is done, the plate is rubbed over with charcoal, black chalk, or black lead, and then the deſign is drawn with white chalk, after which the out-lines are traced out, and the plate finiſhed by ſcraping off the roughneſs, ſo as to leave the figure on the plate. The out-lines and deepeſt ſhades are not ſcraped at all, the next ſhades are ſcraped but little, the next more, and ſo on, till the ſhades gradually falling off, leave the paper white, in which places the plate is neatly burniſhed.

By an artful diſpoſition of the ſhades, and different parts of a figure on different plates, mezzotintos have been printed in colours, ſo as nearly to repreſent very beautiful paintings.

MIASMA, among phyſicians, denotes the contagious effluvia of peſtilential diſeaſes, whereby they are communicated to people at a diſtance. See the articles CONTAGION, PLAGUE, *&c.*

MICA, GLIMMER, in natural hiſtory, a genus of talcs, otherwiſe called bracteārium. See BRACTEARIA.

The bright appearance of the gold and ſilver glimmers, has led ſome to imagine, they were gold and ſilver ores; but the truth is, they contain not the leaſt grain of either of theſe metals, being mere talc, accidentally coloured. See TALC.

MICAH, or the *Book of* MICAH, a canonical book of the Old Teſtament, written by the prophet Micah, who is the ſeventh of the twelve leſſer prophets. He is cited by Jeremiah, and propheſied in the days of Jotham, Ahaz, and Hezekiah. He cenſures the reigning vices of Jeruſalem and Samaria, and denounces the judgments of God againſt both kingdoms. He likewiſe foretells the confuſion of the enemies of the Jews, the coming of the Meſſiah, and the glorious ſucceſs of his church.

MICHAEL, or *Mount St.* MICHAEL. See the article MOUNT.

MICHAELMAS, or *Feaſt of St.* MICHAEL *and all Angels*, a feſtival of the chriſtian church, obſerved on the 29th of September.

MICHELIA, in botany, a genus of the octandria-polygynia claſs of plants, the flower of which conſiſts of eight acute lanceolated petals, leſs than the cup: the fruit conſiſts of a number of globoſe unilocular berries, diſpoſed in a cluſter; in each of which there are four ſeeds, convex on one ſide, and angular on the other.

MICROCOS, in botany, a genus of the polyandria-monogynia claſs of plants, the calyx of which is a five leafed perianthium; the corolla conſiſts of five very ſmall leaves; the fruit is a roundiſh drupe, with one cell, in which is a bony, turbinated, fibrous ſeed.

MICROCOSM, μικροκοσμος, a greek term, ſignifying the little world; uſed by ſome for man, as being ſuppoſed an epitome of the univerſe, or great world.

MICROGRAPHY, μικρογραφια, the deſcription of objects, too minute to be viewed without the aſſiſtance of a microſcope. See the article MICROSCOPE.

MICROLEUCONYMPHÆA, in botany, the ſame with the hydrocharis. See the article HYDROCHARIS.

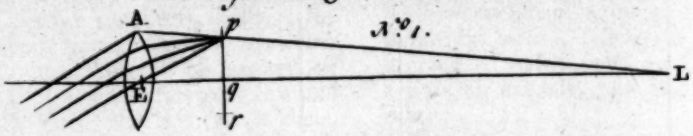
MICROMETER, an aſtronomical machine, which, by means of a ſcrew, ſerves to meaſure extremely ſmall diſtances in the heavens, *&c.* and that to a great degree of accuracy.

The micrometer conſiſts of a graduated circle, (plate CLXXI. fig. 5.) of a ſcrew *qo*, and its index *qr*. The threads of the ſcrew are ſuch, that 50 make the length of one inch exactly. When it is to be uſed, the point *o* is ſet to the ſide of the part to be meaſured, and then the index is turned about with the finger, till the eye perceives the point has juſt paſſed over the diameter of the part; then the number of turns, and parts of a turn, ſhewn by the graduated circle, will give the dimenſions in parts of an inch, as we ſhall ſhew by the following example: Suppoſe it required to meaſure the diameter of an human hair, and I obſerve the index is turned juſt once round, while the point *o* paſſes over it. Then it is plain the diameter of the hair in the image is $\frac{1}{50}$ of an inch. Now if the microſcope, IDEF *def*, magnifies 6 times, or makes the image 6 times larger in diameter than the object, then is the diameter of the hair itſelf but $\frac{1}{6}$ of $\frac{1}{50}$, that is, but $\frac{1}{300}$ part of an inch.

Alſo it is to be obſerved, that as there are 10 large diviſions, and 20 ſmall ones, on

BRITISH MUSEUM

Fig. 1. Single MICROSCOPE.



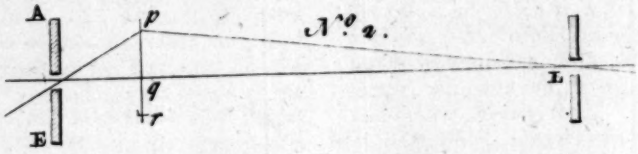


Fig. 2. Double MICROSCOPE

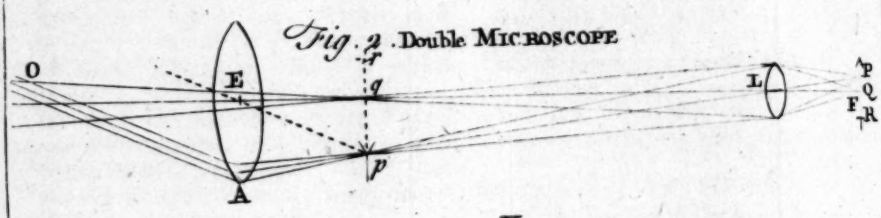
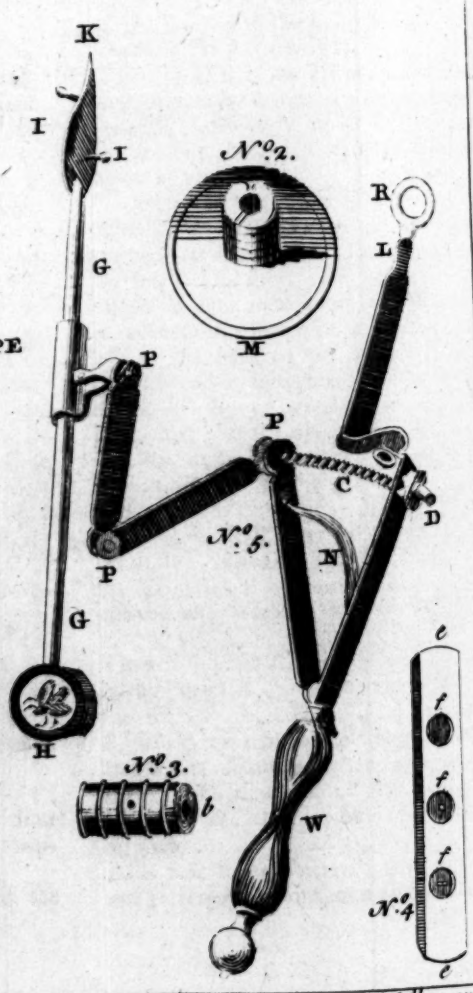


Fig. 3.
Mr Wilson's Pocket-MICROSCOPE
with its Apparatus.



J. Jefferys sculp

on the micrometer-plate, ſo each of thoſe ſmall diviſions are the $\frac{1}{20}$ of $\frac{1}{30}$, or the $\frac{1}{1500}$ part of an inch. Therefore, if, in meaſuring any part of an object, you obſerve how many of theſe ſmaller diviſions are paſſed over by the index, you will have ſo many thouſandth parts of an inch for the meaſure required. All which is ſo plain, that nothing can be ſaid to illuſtrate the matter.

MICROPUS, in botany, a genus of the ſyngeneſia-polygamia neceſſaria claſs of plants, with a paleaceous receptacle, but no pappus or down to the ſeeds; and the corolla is of the naked kind, or has no radius: the flowers are ſmall, and ſtand on the extremities of the branches.

MICROSCOPE, an optical inſtrument, by means whereof very minute objects are repreſented, exceedingly enlarged, and are viewed very diſtinctly according to the laws of refraction, or reflection. See REFRACTION and REFLECTION.

Microſcopes are either ſingle or double; a ſingle microſcope is only a very ſmall globule of glaſs, or a ſmall double convex glaſs, whoſe focal diſtance is very ſhort. A minute object *p q* (plate CLXXII. fig. 1. n° 1.) ſeen diſtinctly through a ſmall glaſs A E by the eye put cloſe to it, appears ſo much greater than it would to the naked eye, placed at the leaſt diſtance *q* L from whence it appears ſufficiently diſtinct, as this latter diſtance *q* L is greater than the former *q* E. For having put your eye cloſe to the glaſs E A, in order to ſee as much of the object as poſſible at one view, remove the object *p q* to and fro till it appears moſt diſtinctly, ſuppoſe at the diſtance E *q*. Then conceiving the glaſs A E to be removed, and a thin plate, with a pin-hole in it, to be put in its place, (*ib.* n° 2.) the object will appear diſtinct, and as large as before, when ſeen through the glaſs, only not ſo bright. And in this latter caſe, it appears ſo much greater than it does to the naked eye, at the diſtance *q* L, either with the pin-hole or without it, as the angle *p* E *q* is greater than the angle *p* L *q*, or as the latter diſtance *q* L is greater than the former *q* E. Since the interpoſition of the glaſs has no other effect than to render the appearance diſtinct, by helping the eye to increaſe the refraction of the rays in each pencil, it is plain that the greater apparent magnitude is entirely owing to a nearer view than could be taken by the naked eye. If the eye be ſo perfect as to ſee diſtinctly by pencils of parallel rays falling upon it, the diſtance, E *q*, of the object from the glaſs, is then the focal diſtance of the glaſs. Now if the glaſs be a ſmall round globule whoſe diameter is $\frac{1}{15}$ of an inch, its focal diſtance E *q* being three quarters of its diameter, is $\frac{1}{20}$ of an inch; and if *q* L be eight inches, the uſual diſtance at which we view minute objects, this globule will magnify at the rate of 8 to $\frac{1}{20}$ or of 160 to 1.

In microſcopes made with ſingle lenſes, a given object placed at their principal focuſes will appear equally diſtinct, if their linear apertures be as their focal diſtances. And in microſcopical lenſes, whoſe focal diſtances are not much longer than half an inch, there is no need to contract their apertures, for procuring diſtinct viſion; the pupil itſelf being ſmall enough to exclude the exterior ſtraggling rays. But in ſmaller lenſes, where apertures are neceſſary, to preſerve the ſame degree of diſtinctneſs, their diameters muſt be as their focal diſtances; and then the apparent brightneſs will decreaſe in a duplicate ratio of their focal diſtances, ſo that by uſing ſmaller glaſſes the apparent magnitude and the obſcurity of the object will both increaſe in the ſame ratio.

A double microſcope is compoſed of two convex glaſſes placed at E and L. (*ibid.* fig. 2.) The glaſs L next the object P Q is very ſmall and very much convex, and conſequently its focal diſtance L F is very ſhort; the diſtance L Q of the ſmall object P Q, is but a little greater than L F; ſo that the image *p q*, may be formed at a great diſtance from the glaſs, and conſequently may be much greater than the object itſelf. This picture *p q* being viewed through a convex eye-glaſs A E, whoſe focal diſtance is *q* E, appears diſtinct. Now the object appears magnified upon two accounts; firſt, becauſe if we viewed its picture *p q* with the naked eye, it would appear as much greater than the object, at the ſame diſtance, as it really is greater than the object, or as much as L *q* is greater than L Q; and ſecondly, becauſe this picture appears magnified through the eye-glaſs as much as the leaſt diſtance at which it can be ſeen diſtinctly with the naked eye, is greater than *q* E, the focal diſtance of the eye-glaſs. For example, if this latter ratio be 5 to 1, and the former ratio of L *q* to L Q be 20 to 1, then upon both accounts the

object will appear 5 times 20, or 100 times greater than to the naked eye.

To fit theſe microſcopes to ſhort-ſighted eyes, the glaſſes E and L muſt be placed a little nearer together; ſo that the rays of each pencil may not emerge parallel, but may fall diverging upon the eye; and then the apparent magnitude will be altered a little, but ſcarce ſenſibly.

To make glaſs globules for MICROSCOPES.

Mr. Butterfield, in the Philoſophical Tranſactions, n° 141, ſays, he had tried ſeveral ways of making glaſs-globules of the bigneſs of great pin-heads and leſs, as in the flame of a candle made of tallow or wax; but that the beſt ſort of flame for making them clear and without ſpecks, was that of a lamp made with rectified ſpirit of wine, where inſtead of a cotton wick, he made uſe of fine ſilver-wire, doubled up and down like a ſkein of thread. Then having prepared ſome fine glaſs, beaten to powder and waſhed very clean, he took a little of it upon the ſharp point of a ſilver-needle wetted with ſpittle, and held it in the flame, turning it about till it melted and became quite round, but no longer, for fear of burning it. The art lies in giving the globule an exact roundneſs, which can only be learned by experience. When a great many globules are thus formed, he rubs them clean with a ſoft leather. Then having ſeveral ſmall pieces of thin braſs-plates, twice as long as they are broad, he doubles them up into the form of a ſquare, and punches a fine hole through the middle of them: and having rubbed off the bur about the holes with a whetſtone, and blacked the inſides of the plates with the ſmoke of a candle, he places a globule between the two holes, and tacks the plates together with two or three rivets. Then he tries how they magnify ſmall objects; and keeps the beſt of them for uſe.

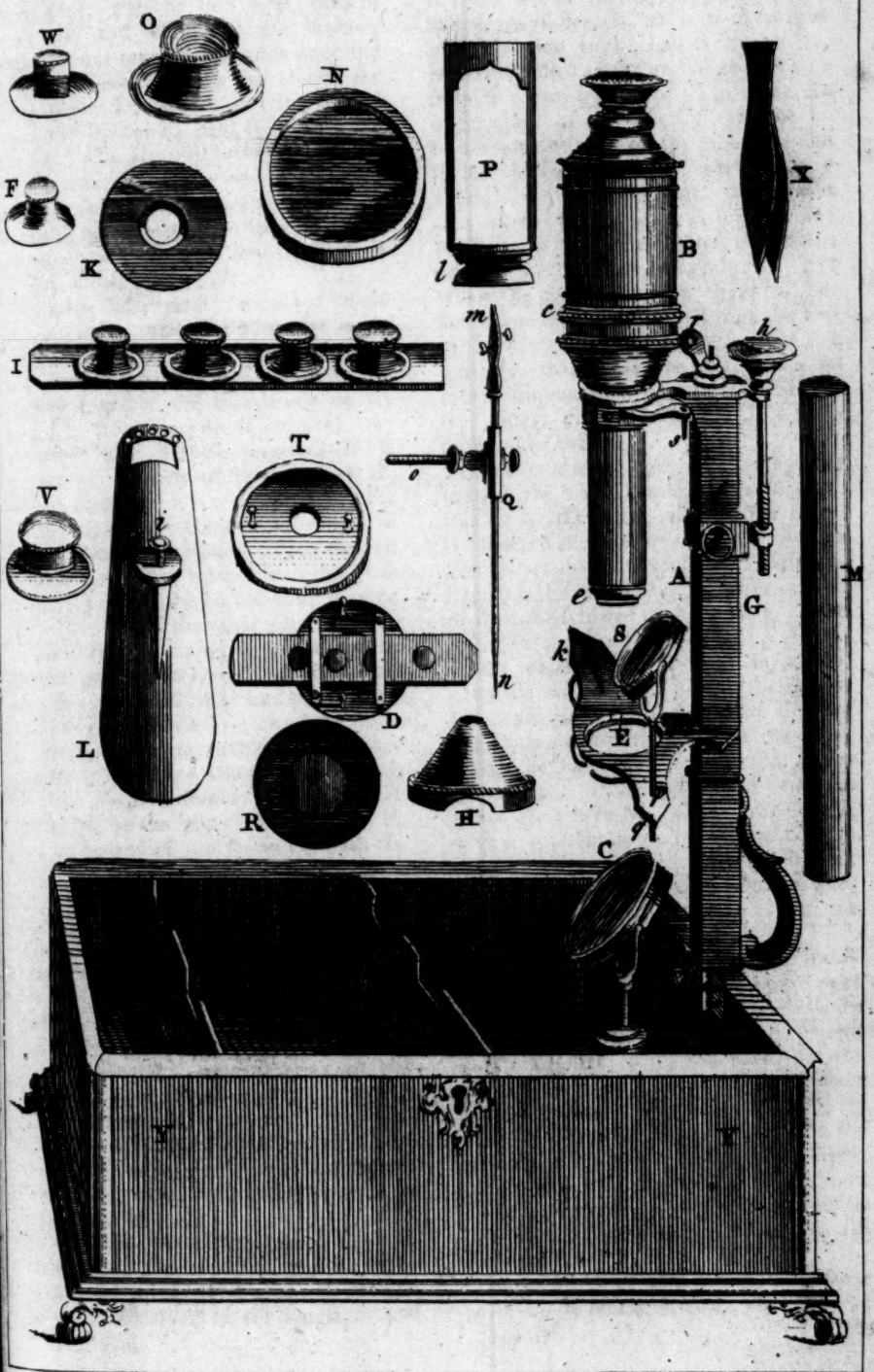
Dr. Hook uſed to take a very clear piece of glaſs, and to draw it out into long threads in a lamp; then he held theſe threads in the flame till they run into round globules hanging to the end of the threads. Then having fixt the globules with ſealing wax to the end of a ſtick, ſo that the threads ſtood upwards, he ground off the ends of the threads upon a whetſtone, and poliſhed them upon a ſmooth metal-plate with a little putty.

Mr. Stephen Gray, in the Philoſophical Tranſactions, n° 221, 223, ſays, that for want of a ſpirit-lamp, he laid a ſmall particle of glaſs, about the bigneſs of the intended globule, upon the end of a charcoal; and by the help of a blaſt-pipe, with the flame of a candle, he ſoon melted it into a globule. By this means he made them indifferently clear, and the ſmalleſt very round; but the larger, by reſting upon the coal, were a little flatted, and received a roughneſs on that ſide. Therefore he was wont to grind and poliſh them upon a braſs plate, till he reduced them to hemiſpheres. But he found that the ſmall round globules, beſides that they magnified more, ſhewed objects more diſtinct than the hemiſpheres.

Mr. Wilſon's pocket-microſcope, has nine different magnifying glaſſes, eight of which may be uſed with two different inſtruments, for the better applying them to various objects. One of theſe inſtruments is repreſented by A A B B (*ibid.* fig. 3. n° 1.) and is made of ivory or braſs; it has three thin braſs-plates at E, and a ſpiral ſpring of ſteel-wire H within it; to one of the thin plates of braſs is fixed a piece of leather F, with a ſmall furrow G both in the leather and braſs to which it is fixed: in one end of this inſtrument is a long ſcrew D, with a convex glaſs C, placed in the end of it: in the other end of the inſtrument there is a hollow ſcrew *o o*; wherein any of the magnifying glaſſes, M, (*ib.* n° 2.) are ſcrewed when they are to be made uſe of. The nine different magnifying glaſſes are all ſet in ivory, eight of which are ſet in the manner expreſſed at M. The greateſt magnifier is marked upon the ivory wherein it is ſet, with n° 1. and ſo on to n° 8; the ninth glaſs is not marked, but is ſet in the manner of a little barrel-box of ivory, as at *b*. (*ib.* n° 3.) At *e e* is a flat piece of ivory, (*ib.* n° 4.) whereof there are eight belonging to this microſcope, tho' any one may have as many as he pleaſes; in each of them are three holes *f f f*, wherein three or more objects are placed between two thin glaſſes, or pieces of talc, when they are to be uſed with the greater magnifiers.

The uſe of this inſtrument A A B B is this: having taken the handle W from the inſtrument (*ib.* n° 5.) and ſcrewed it upon the button S in n° 1. take one of your flat pieces of ivory *e e*, or ſliders, and ſlide it betwixt the two thin plates of braſs at E, through the body of the microſcope, ſo that the object you intend to look upon be juſt in the middle; [illegible] marking

Ayscough's Single and Compound MICROSCOPE, for viewing both transparent and opake Objects.



J. Jefferys sculp.

BRITISH MUSEUM

marking that you put that ſide of the plate *e e*, where the braſs rings are, fartheſt from the end A A: then you are to ſcrew into *o o* (the hollow ſcrew in the end of your microſcope) the 3d, 4th, &c. magnifying glaſs M; which being done, put the end A A cloſe to your eye, and while you are looking through your magnifying glaſs upon the object, you are to ſcrew in or out the long ſcrew D, which moving round upon the leather F, held tight to it by the ſpiral wire H, will bring your object to the true diſtance; which you will know by ſeeing it clearly and diſtinctly: after this manner may be ſeen all tranſparent objects, duſts, liquids, cryſtals of ſalts, ſmall inſects, &c.

The other inſtrument (*ib.* 5.) is made of braſs, with joints P P P to turn eaſily any way, and with a ſmall pair of tongs G G, which open at the points K, by preſſing together the two heads of the pins I I, for taking up of objects. At the other end of theſe tongs G G, is ſcrewed on a piece of black wood H, with a piece of ivory ſet into it, for placing opake objects on, according to their difference of colour. Upon the end L there is a ſcrew, upon which the glaſs *b* (n° 3.) ſet in the barrel-box, may be ſcrewed. When the other glaſſes are to be uſed, there is a ring R of braſs to be ſcrewed on the end L, into which ring all the other glaſſes M, may be ſcrewed. So when any object is taken up in the point of the tongs K, or laid upon the other end H, it may very eaſily be applied to the true focal diſtance of any of the glaſſes M, by the help of the joints P P P, and by means of the ſcrew C, with the wheel D, which being regulated by a ſpring N, will bring the objects to the exact diſtance for diſtinct viſion.

The glaſs placed in the manner of a barrel-box at *b*, (*ib.* n° 3.) is only to be uſed with the braſs-inſtrument, or in your own hand, being the leaſt magnifier, for greater objects, ſuch as flies and common inſects, &c. remembering to put the hole *b* next to your eye.

The ingenious Mr. Ayſcough has contrived a microſcope, which may be uſed either with a ſingle or with compound lenſes, and that for opake as well as tranſparent objects.

Being taken out of the box Y Y, and fitted for obſervation, it ſtands as in plate CLXXIII. the bottom of the pillar A being fixed in the ſocket *a*, and faſtened by the ſcrew *b*; the body of the microſcope, B, fixed in the collar *c*; and the illuminator, C, placed underneath the ſtage at *d*.

If an object in an ivory-ſlider is to be viewed, the apparatus D is to be fixed in the center of the ſtage E. This done, ſuch a magnifier, F, as is moſt proper in proportion to the ſize of the object, is to be applied to the end of the tube *e*: ſuppoſe the magnifier n° 1. be uſed, the upper edge of the collar *f* muſt be ſet to the ſame number on the pillar A; and if not perfectly diſtinct, the button *g* muſt be ſcrewed tight; and then, by a turn or two of the button *h*, it is adjuſted to the focus with the greateſt exactneſs: and ſo of the other magnifiers. But when the object is placed above or beneath the ſtage, no regard muſt be had to the number on the pillar A; but the pillar G, that carries the object, is to be moved higher or lower, till the object is ſeen nearly diſtinct, and then it is to be adjuſted as before.

Whenever the 1ſt, 2d, or 3d magnifier is uſed, the cone H muſt be placed at the bottom of the ſtage, whereby the object is rendered much more diſtinct. And to ſave the trouble of often ſcrewing and unſcrewing the magnifiers, let three or four of them be ſcrewed to the plate I, which ſlides in the dove tail of the plate K.

If the object to be viewed be a fiſh, place its tail over the hole at the end of the braſs plate L; and then by ſlipping the button *i* into the ſlit *k* on the ſtage, it will be fixed under the bottom of the microſcope. Frogs, &c. muſt be placed in the glaſs tube M. The braſs-cup N, with a glaſs-bottom, is made to contain any fluid for viewing aquatic objects: and to ſecure any object for obſervation, confine it between the glaſſes in the box O.

Theſe are the parts for viewing tranſparent objects; and thoſe for opake ones are a ſilver-ſpeculum, which ſcrews into the end of the braſs-cylinder P, at *l*: and here the fourth, fifth, and ſixth, are the moſt proper magnifiers. Moſt inſects may be confined by the forceps *m*, at the end of the ſteel-wire Q; or, on the point *n*. To view objects by candle-light, place them on the piece R, which muſt be laid on the ſtage, where they will be illumined by the lens S, ſupported by the ſtem *p q*.

The method of uſing this microſcope with ſingle lenſes, is this: the body of

the compound microſcope muſt be taken out of its collar *c*, and the apparatus D placed in the ſame; the ſtem, *r*, muſt be turned over the ſtage, to ſupport the magnifiers; the braſs plate T, with a hole to receive the illuminator, C, muſt be fixed in the center of the ſtage; all the magnifiers, except V, ſcrew in underneath the ſtem *r*; but this, and all others with covers, ſcrew in above it. W is a ſilver-ſpeculum, uſed in this apparatus; and X is a forceps, to take up any object with.

Double reflecting MICROSCOPE, in uſe at preſent, is an alteration and improvement by Mr. Culpepper and Mr. Scarlet, of Mr. Marſhal's large double microſcope; than which it is leſs cumberſome, may be managed with much more eaſe, and by means of a reflected light, is capable of ſhewing objects in a clearer and more pleaſing manner. The body of this microſcope, A A A A, (plate CLXXIV.) being a large tube, is ſupported by three braſs-pillars *b b b*, riſing from a wooden pedeſtal C; in which pedeſtal there is a drawer D, to hold the object glaſſes, and other parts of the apparatus.

A leſſer tube *e e*, ſlides into the greater, and ſends from its bottom another tube much ſmaller than itſelf, *f*, with a male ſcrew at the end thereof, whereon to ſcrew the object-glaſs or magnifier. There are five of theſe magnifiers numbered 1, 2, 3, 4, 5, which numbers are alſo marked on the inner tube, to direct whereabout to place it according to the magnifier made uſe of: but if then it fits not the eye exactly, ſlide the inner tube gently higher or lower, or turn the ſcrew of the magnifier gradually till the object appears diſtinct. O is a round braſs-plate with ſeveral holes for placing objects in, but two holes are commonly reſerved for ſmall concave-glaſſes, whereon to place a drop of any liquid, in order to view the animalcules, *&c.* There is alſo a piece of white ivory, and a piece of black ebony, of the ſame ſize and ſhape as the holes for objects: the ivory is to put opake objects on that are black, and the ebony is to receive ſuch as are white; by which contrariety of colours they will be ſeen more clearly. Q is a concave looking-glaſs, which reflects the light of a candle, or the ſky, directly upwards on the object to be viewed. V is a plano-convex lens, which ſerves to tranſmit the light of a candle or ſun-ſhine upon any opake object which is placed on the ivory or ebony for examination.

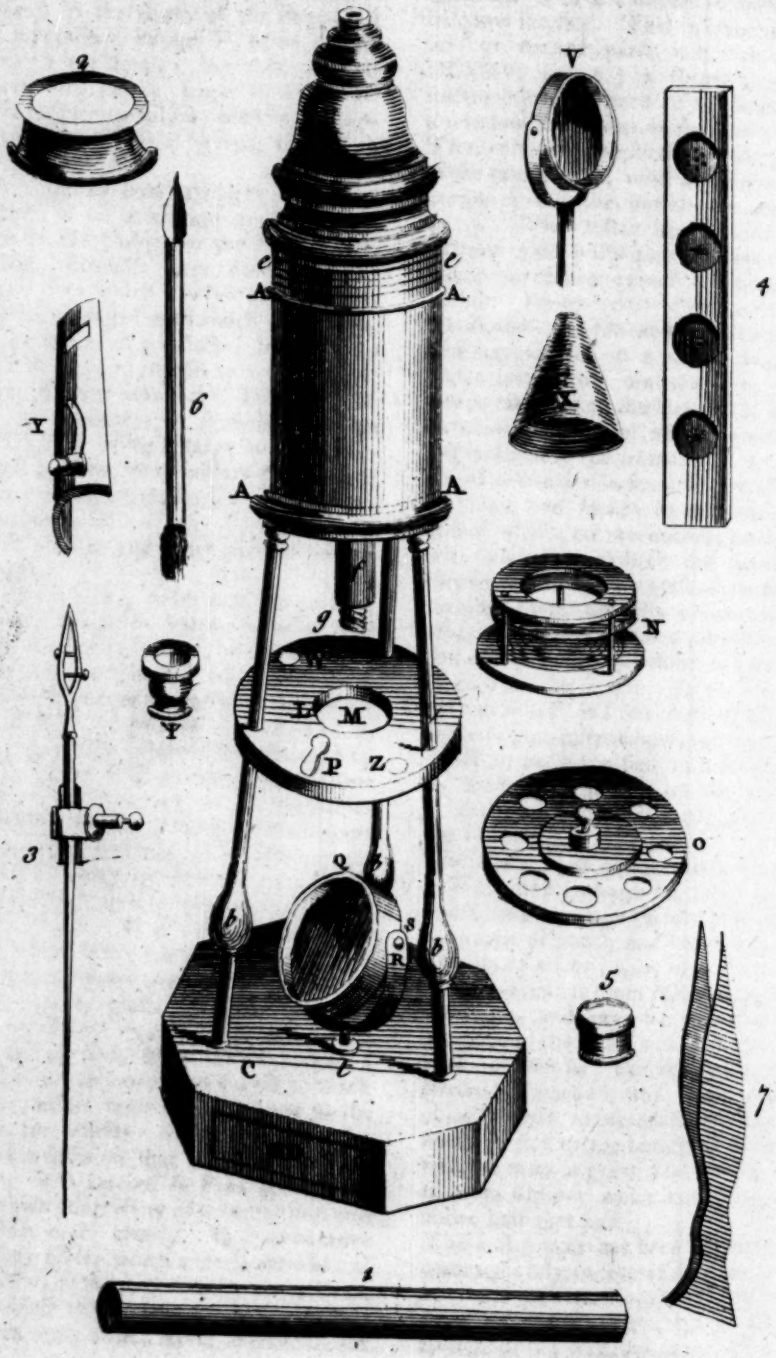
The ſolar or camera obſcura MICROSCOPE, depends on the ſun-ſhine, and muſt be made uſe of in a darkened-chamber, as its name implies. This inſtrument conſiſts of ſeveral parts, *viz.* A (plate CLXXV. fig. 2.) a ſquare frame of mahogany to be fixed to the ſhutter of a window, by means of the ſcrews 1, 1. To this frame is applied a circular collar of the ſame wood, with a groove on its periphery on the outſide, denoted by 2, 3. This collar is connected by a cat-gut to the pully 4 on the upper part, which is turned round by the pin 9 within. On one part of the collar, on the outſide, is faſtened, by hinges, a looking glaſs G, in a proper frame, to which is fixed the jointed wire 6, 7; by which means, and the ſcrew H 8, it may be made to ſtand in an angle more or leſs inclined to the frame. In the middle of the collar is fixed a tube of braſs C, near two inches in diameter; the end of which, on the outſide, has a convex lens 5 to collect the ſun-beams thrown on it by the glaſs G, and converging them towards a focus in the other part, where D is a tube ſliding in and out to adjuſt the object to a due diſtance from the focus. To the end G of another tube F, is ſcrewed one of Wilſon's ſingle pocket-microſcopes, containing the object to be magnified in a ſlider; and by the tube F, ſliding on the ſmall end E of the tube D, it is brought to a due focal diſtance.

The ſun's rays being directed by the looking-glaſs through the tube upon the object, the image or picture of the object is thrown diſtinctly and beautifully upon a ſcreen of white paper, or a white linen ſheet, placed at ſome diſtance to receive the ſame; and may be magnified to a ſize beyond the imagination of thoſe who have not ſeen it. For the farther off the ſcreen is removed, the larger will the object appear, inſomuch that a louſe may be magnified to the length of five or ſix feet, or even a great deal more; but it is more diſtinct when not enlarged to above half that ſize.

This inſtrument has been contrived very commodiouſly in ſeveral different forms; but we ſhall here illuſtrate the following by a diagram. A R (*ibid.* n° 2.) is a ſection of the window-ſhutter of a dark room,

BRITISH MUSEUM

The Double reflecting MICROSCOPE.



T. Jeffreys sculp

room, CD of the frame containing a ſcioptric ball EF; in the forepart whereof is ſcrewed the tube GIKH, at one end of which is a lens GH, which, by converging the ſun-beams into a narrow compaſs, does ſtrongly enlighten the ſmall object *ab*, placed on a ſlip of glaſs, or otherwiſe, in the part of the tube NQ, where a ſlit is made on each ſide for that purpoſe. Within this tube there ſlides another, L*mr*M, which contains a ſmall magnifying lens *mr*. By moving the exterior tube, IGHK, one way and the other, the glaſs GH will be brought to receive the rays of the ſun directly, and will therefore moſt intenſely illuminate the object *ab*. The other tube, LM, being ſlid backwards and forwards, will adjuſt the diſtance of the ſmaller lens *mr*, ſo that the image of the object *ab* ſhall be made very diſtinct, on the oppoſite ſide of the room at OP; and the magnitude of the image will be to that of the object, as its diſtance from the lens *mr* is to the diſtance of the object from it, as is evident from the figure.

Thus, for example, ſuppoſe the focal diſtance of the lens *mr* to be one inch $= r$, and let the diſtance at which it is placed from the object be 1, $1 = d$; then, if the lens be double and equally convex, as uſual, the diſtance of the image will be $\frac{dr}{d-r} = f = 110$; therefore the image will be 110 times larger than the object in its linear dimenſions, and $110 \times 110 = 12100$ times larger in ſurface; and in ſolidity it will be $110 \times 110 \times 110 = 1333000$ times larger than the object.

This is the moſt entertaining of any; and, perhaps, the moſt capable of making diſcoveries in objects that are not too opake, as it ſhews them much larger than can be done any other way. Such too as have no ſkill in drawing, may, by this contrivance, eaſily ſketch out the exact figure of any object they have a mind to preſerve a picture of.

The MICROSCOPE *for opake objects*, remedies the inconvenience of having the dark ſide of an object next the eye, which has hitherto been an unſurmountable obſtruction to the making obſervations on opake objects with any conſiderable degree of exactneſs or ſatisfaction: and notwithſtanding ways have been tried to point light upon an object from the ſun or a candle, by a convex glaſs placed on the ſide thereof; yet the rays from either can be thrown upon it in ſuch an acute angle only, that they ſerve to give a confuſed glare, but are inſufficient to afford a clear and perfect view of the object. But in this new microſcope, by means of a concave ſpeculum of ſilver, highly poliſhed, in whoſe center a magnifying lens is placed, ſo direct and ſtrong a light is reflected upon the object, that it may be examined with all imaginable eaſe and pleaſure.

Catoptric MICROSCOPE. Though microſcopes compoſed of refracting glaſſes only have been vaſtly improved as to their effects of magnifying, yet they have been attended with ſuch great inconveniencies, that their application to many arts, in which they might be very convenient, is not ſo common as might be expected. There is a catoptric microſcope deſcribed in the Philoſophical tranſactions, n° 442. which remedies moſt of the defects of the others, and is made on the model of the newtonian teleſcope. This microſcope magnifies from the diſtance of nine to twenty-four inches. The manner of uſing this inſtrument as a microſcope is this: when it is fixed on its ſtand, the ſmall ſpeculum A (plate CLXXV. fig. 1.) muſt be thruſt home in its ſlider, in the inſide of the mouth of the inſtrument B, and the ſcrew C turned till the index D cuts one of the numbers at M; then the mouth of the inſtrument B muſt be removed from the object the diſtance in inches expreſſed by that number, and be directed towards the object, by looking through the hole in the great ſpeculum; the tube that holds the eye-glaſſes being taken off, and adjuſting it by means of two racks E and E, in ſuch manner, that the image of the object may be viſible in the middle of the little ſpeculum: then the tube F, holding the eye-glaſs, muſt be ſcrewed on, and the ſmall eye-hole in the little braſs-plate, which turns on a pivot, applied.

N. B. As the ſame adjuſtment of the ſpeculum will not ſuit all eyes, the ſcrew C muſt be turned round to the right or left a little, till the object appears diſtinct. This inſtrument, beſides its uſe as a microſcope, is convertible into a gregorian teleſcope, by changing the ſmall ſpeculum for one of a different focus.

MIDAS-EAR-SHELL, the ſmooth ovato-oblong buccinum, with an oblong and very narrow mouth. It conſiſts of ſix volutions, but the lower one alone makes up almoſt the whole ſhell. See BUCCINUM.

MID-HEAVEN, the point of the ecliptic

that culminates, or in which it cuts the meridian.

MIDDLEBURG, the capital city of Zealand, one of the United Provinces, ſituated in the iſland of Walcherin, twenty-ſix miles north-eaſt of Bruges.

MIDDLEBURG, a caſtle of dutch Flanders, eight miles north-eaſt of Bruges.

MIDDLEHAM, or MIDHAM, a market-town in the north riding of Yorkſhire.

MIDDLESEX, a county of England, in which London, the metropolis, ſtands; it is twenty-four miles long, and only fourteen broad, and is bounded by Hertfordſhire, on the north; by the river Lea, which divides it from Eſſex, on the eaſt; by the river Thames, which ſeparates it from Surry, on the ſouth; and by the brook Colne, which divides it from Buckinghamſhire, on the weſt. See the article LONDON.

MIDDLEWICH, a market-town of Cheſhire, fifteen miles eaſt of Cheſter.

MIDHURST, a borough town of Suſſex, ten miles north of Chicheſter; which ſends two members to parliament.

MIGRATION, the paſſage or removal of a thing out of one ſtate into another. See TRANSMIGRATION and PASSAGE.

MILAN, the capital of the Milaneſe, or dutchy of Milan, in Italy: eaſt long. 9° 30′, north lat. 45° 25′.

MILAZZO, or MELAZZO, a port-town of Sicily, thirty miles north-weſt of Meſſina.

MILBORN-PORT, a borough-town of Somerſetſhire, twenty-five miles ſouth of Bath. It ſends two members to parliament.

MILDENHALL, a market-town of Suffolk, ten miles north-weſt of Bury.

MILDEW, *rubigo*, a diſeaſe happening to plants, cauſed by a dewy moiſture, ſuppoſed by ſome to be a ſpecies of blight. See the article BLIGHT.

MILE, *mille paſſus*, a meaſure of length or diſtance, containing eight furlongs, &c. See the article MEASURE.

The engliſh ſtatute-mile is fourſcore chains, or 1760 yards; that is, 5280 feet. See CHAIN, YARD, and FOOT.

We ſhall here give a table of the miles in uſe among the principal nations of Europe, in geometrical paces, 60,000 of which make a degree of the equator.

Geographical Mile — 1000 — Geometrical paces.
60 to a degree

	Geometrical paces.
Mile of Ruſſia	750
of Italy	1000
of England	1250
of Scotland and Ireland	1500
Old league of France	1500
The ſmall league, *ibid.*	2000
The mean league, *ibid.*	2500
The great league of France	3000
Mile of Poland	3000
of Spain	3248
of Germany	4000
of Sweden	5000
of Denmark	5000
of Hungary	6000

MILFORD-HAVEN, the moſt commodious harbour in Great-Britain, ſituated in the ſouth-weſt part of Pembrokeſhire in Wales, at the north entrance of the Briſtol-channel.

MILIARY, in general, ſomething reſembling millet ſeeds.

Anatomiſts give the name miliary-glands to numerous ſpherical bodies, each with an excretory duct, found in the noſe, the eye-lids, the ears, the nipples, under the arm-pits, and in the cutis of the penis and ſcrotum, the pudenda of women, and about the anus: but they are found to vary extremely, both as to ſize and number, in different perſons; and Heiſter, Boerhaave, Ruyſch, and others, declare, that theſe globoſe bodies are not true glands, but only certain ſecretory ducts from the arteries of the ſkin; which either from the denſity of the cuticle in thoſe parts, or from the thickneſs of the matter contained in them, becoming obſtructed, are thereby formed into theſe tubercles.

MILIARY FEVER, a malignant fever, ſo called from the eruption of certain puſtules reſembling millet-ſeeds.

It begins with a ſlight ſhivering, ſucceeded by heat and loſs of ſtrength, ſometimes even to faintneſs; there is a ſtraitneſs and anxiety about the breaſt, attended with deep ſighs, reſtleſſneſs, and diſturbed ſleep; and to theſe ſucceed a roughneſs of the ſkin like that of a gooſe, and a great number of puſtules appear, ſometimes white and ſometimes red, or both together, of the ſize of a millet or muſtard-ſeed. They firſt beſet the neck, then the breaſt and back, and afterwards the arms and hands: and when theſe appear, the other ſymptoms gradually go off; the puſtules ripening, and containing a ſtinking ichor. Theſe puſtules appear on the third, fourth, ſeventh, or ſometimes not till the fourteenth day.

The principal intention of cure, is to expel and keep out the morbific matter which forms the puſtules; for it is often fatal

MICROSCOPES.

Fig. 1. A Catoptric Microscope.

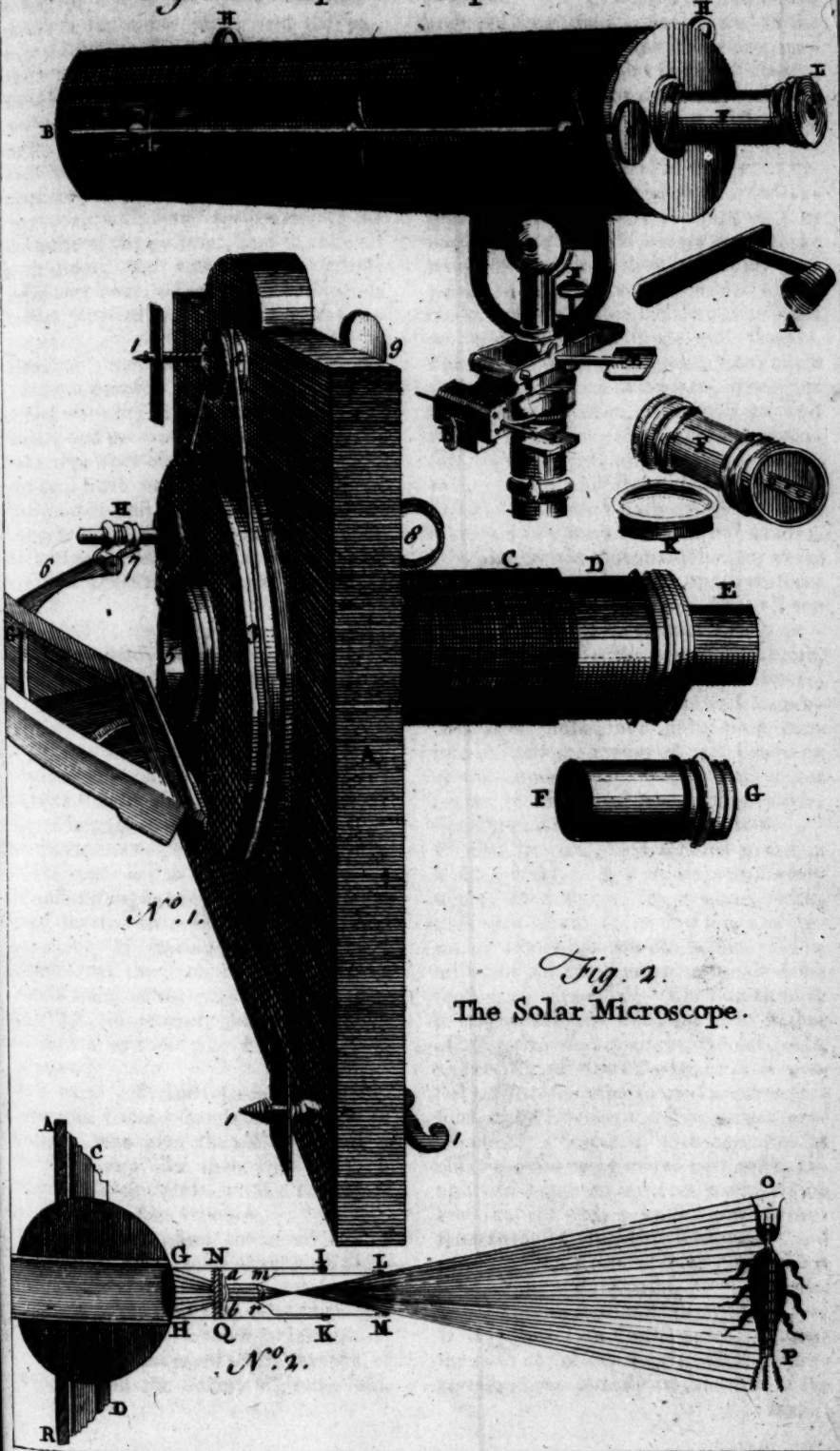


Fig. 2.
The Solar Microscope.

T. Jeffreys sculp.

BRITISH MUSEUM

fatal when the puſtules diſappear, and cannot be driven out again. Bleeding ſhould be cautiouſly uſed; and the patient ſhould not riſe out of bed, or continue long in an erect poſture, for fear of fainting, or ſtriking the puſtules in: analeptic medicines are neceſſary to keep up the ſpirits; and to theſe may be added, according to circumſtances, gentle diaphoretics. Some greatly commend diaphoretic antimony, for promoting the diſcharge of the puſtules, and to take off a delirium; the doſe being a ſcruple every ſixth hour. Hoffman recommends bliſters, applied to the legs, for the ſame purpoſe.

Hamilton's method of cure is to give the teſtaceous powders, which keep up a moderate warmth, abſorb the acidity of the blood, and promote a breathing ſweat: take of powder of crab's claws and ſperma-ceti, each one ſcruple; of ſaffron, five grains; and of the pectoral ſyrup as much as is ſufficient to make into a bolus, to be taken every ſixth hour. Bliſters are alſo neceſſary through the whole courſe.

MILITANT, or CHURCH-MILITANT, denotes the body of chriſtians while here on earth. See the article CHURCH.

MILITARY, ſomething belonging to the ſoldiery or militia.

MILITARY ARCHITECTURE, the ſame with fortification. See FORTIFICATION.

MILITARY ART, the ſcience or art of making or ſuſtaining war to advantage.

MILITARY WAYS, *viæ militares*, the large roman roads which Agrippa procured to be made through the empire in Auguſtus's time, for the marching of troops and conveying of carriages. Theſe were paved from the gates of Rome, to the utmoſt limits of the empire. See ROAD.

MILITIA, in general, denotes the body of ſoldiers, or thoſe who make profeſſion of arms.

In a more reſtrained ſenſe, militia denotes the trained bands of a town or country, who arm themſelves, upon a ſhort warning, for their own defence. So that, in this ſenſe, militia is oppoſed to regular or ſtated troops.

For the direction and command of the militia, the king conſtitutes lords-lieutenants of each county.

MILIUM, MILLET. See MILLET.

MILK, *lac*, a well known animal fluid, which nature prepares in the breaſts of women, and the udders of other animals, for the nouriſhment of their young. Milk, according to Boerhaave, is a liquor prepared from the aliment chewed in the mouth, digeſted in the ſtomach, perfected by the force and juices of the inteſtines, and elaborated by means of the meſentery and its gland and juices, and the juices of the thoracic duct. It has undergone ſome actions of the veins, arteries, heart, lungs, and juices, and began to be aſſimilated; yet may ſtill be had ſeparate and diſcharged out of the body. And thus by their own milk, prepared from the proper matter of the chyle, all the known lactiferous animals are nouriſhed, both male and female. For milk is always prepared from chyle as well in men as in women, in virgins and barren women, in mothers and nurſes. Whence every ſuch animal conſiſts, is nouriſhed, and lives on its own proper milk; and from this alone prepares all the other parts, both the ſolid and fluid, by means of the vital actions. It is alſo certain that many live for years by feeding on milk alone, and perform all the actions of life, and have all the ſolid and fluid parts of their bodies perfectly elaborated: the ſerum, therefore, the blood, the lymph, the ſpirits, bones, cartilages, membranes, and veſſels, proceed from milk; and milk muſt contain in itſelf the matter of all the parts of the human body. Milk approaches nearer to an animal nature than chyle. See CHYLE and CHYLIFICATION.

If milk be good, and ſuffered to reſt in a clean veſſel, it firſt appears uniformly white; then throws up a white, thick, unctuous cream to its ſurface, and remains ſomewhat bluiſh below. The milks of all the known animals have theſe properties alike. The human milk is very ſweet and thin, the next is that of aſſes, then that of mares, then of goats, and laſtly of cows: whence it is preſcribed in this order to conſumptive perſons of weak viſcera. The rennet prepared of the juices of ſuch creatures as chew the cud being mixed with milk, coagulates it into an uniform maſs, which may be cut with a knife, and it thus ſpontaneouſly ſeparates into whey and curds; if long boiled over the fire, it loſes its more fluid parts, and condenſes into a butyraceous and cheeſy maſs.

It may be ſhewn from reaſon, without the evidence of experience, that milk is an efficacious remedy in diſorders of the breaſt.

breaſt. But it is to be obſerved, that all milks are not of the ſame kind, and of the ſame efficacy for all purpoſes: ſince, according to the diverſity of animals and their reſpective foods, they are poſſeſſed of different and peculiar qualities which are to be conſidered apart. Firſt, then, aſſes-milk, which was always greatly eſteemed by the antients, contains a great deal of ſweet ſerum, but a very ſmall quantity of earthy, caſeous, and pinguious ſubſtance, for which reaſon it is not eaſily coagulated, and, conſequently, but very unfit for butter and cheeſe. Its whey is aſtringent, laxative, moiſtening, and proper for correcting the acrimony of the humours. Goats-milk does not contain ſo large a quantity of whey as that of aſſes, nor is it of ſo laxative and aſtringent a nature, but of a thicker conſiſtence. And, as goats eat the leaves of trees which contain ſomething of a reſinous quality, their milk is very efficacious for the conſolidation of ſuppurated parts. Cows-milk is more pinguious, contains a large quantity of earth, but leſs whey, for which reaſon it generally yields a great deal of butter and cheeſe. This ſpecies of milk is of a temperating, nutritive, and conſolidating virtue. Women's milk, for medicinal purpoſes, is preferable to all others; for it is the ſweeteſt of them all, and its nutritive quality is ſufficiently obſervable in infants. The virtues of milk are alſo different, according to the diverſity of herbs and paſturage, which animals eat. Hence milk in the ſpring is highly ſalutary, becauſe at that time the vegetables abound with temperate juices; whereas milk in the winter is accounted leſs ſalutary, becauſe the animals feed on hay and ſtraw. According to Quincy, milk is very proper to alter a ſharp thin blood into a craſis more ſoft, balſamic, and nutritive; and in the conſtitutions, where it agrees in the firſt paſſages, it cannot but be proper for ſuch an end, as being already prepared into nouriſhment as far as is required for its admiſſion into the blood.

Where milk of what kind ſoever is ordered in conſumptions, and as a reſtorative, it is with very good reaſon joined with the teſtacea, and ſuch things as are proper to deſtroy acidities. As for the difference of milks from the different creatures which produce them, there ſeems as much owing to their different food and manner of living, as to any ſpecific difference in the creatures themſelves. That which is moſt common in our food, cow's milk, ſeems to be of the moſt ſubſtance and moſt nutritive of all. In the uſe of theſe there is a great deal in being more or leſs accuſtomed to any particular ſort; for at firſt, with many, it is frequently purgative, but this does not continue. In ſhort, experience is the beſt guide in theſe courſes, and phyſicians of the beſt ſkill and penetration ſometimes are diſappointed in their expectation from their uſe. There are ſome other intentions for which milk courſes are directed beſides that of a reſtorative; for they are gone into frequently as correctors and ſweetners, but they are not to be truſted to in ſuch caſes, although they certainly are good helps together with more effectual means.

Dr. Cheyne recommends a milk and ſeed-diet with water for drink, as the ſureſt preſervative againſt diſeaſes, and cure of them. See GOUT, PALSY, *&c.*

Diſorders from MILK. The milk is often very troubleſome and dangerous to women in their lying-in, and ſubjects them to many painful diſorders. The milk fever happens on the third or fourth day from delivery, and ariſes from a conjection of milk in the breaſts, which frequently extend to the arm-pits, where the pain is ſometimes violent. This fever generally continues a day or two, and ends ſpontaneouſly, by the benefit of nature, in copious ſweats, which are proportionable to the cold fits or preceding rigours. There may ſometimes be occaſion for hot diluents and gentle diaphoretics: the patient ſhould uſe a ſlender diet, and put the child often to the breaſt; but if ſhe does not deſign to give ſuck, a ſlender diet, teſtaceous powders, and diaphoretics will be more neceſſary; and the breaſt ſhould be drawn by ſome proper perſon. If the flux of the lochia be too ſparing, it ſhould be promoted. If the pain is great, the lochia commonly ſtop; but flow again when it ceaſes. To prevent the inſpiſſation of the milk, the breaſts may be embrocated with warm linſeed-oil, or oil of ſweet almonds, or the leaves of red cabbage may be laid thereto. If the fever is very acute and hot, and an inflammation of the breaſt is feared, it will be proper to bleed. Women commonly put double cloths dipt in brandy under the arm-pits, to drive back the milk. See the article INFLAMMATORY FEVERS.

A too great thinneſs of the milk is a common

common complaint with nurſes: this is to be laid ſometimes to the diet, ſometimes to the concoction, and ſometimes to the unnatural tenuity of the humours. In this caſe the milk is ſometimes perfectly watry, and the child is thrown into an atrophy by it. The remedies for this are a change of diet, and a purging of the primæ viæ, by ſome gentle cathartic, and afterwards a ſtrengthening of them, by bitters and ſtomachic medicines: ſometimes it is alſo neceſſary to evacuate the ſerous humours, by the common phlegmagogues, ſuch as jalap in proper doſes, with a little powdered ginger, which is an excellent corrective for it.

The milk is ſometimes ſalt to the taſte, and ſometimes of a bilious yellow colour, and theſe diſtemperatures of it uſually throw the child into colics, diarrhœas, vomitings, cutaneous eruptions with ſcabs, ſometimes abſolute ulcerations, and ſometimes into fevers. In this caſe the nurſe is to take the abſorbents and nitrous medicines with intermediate purges; but during the courſe of taking theſe remedies, and for ſome time afterwards, the diet muſt be under ſome regulations, particularly ſalt foods are to be avoided, and all acids, aromatics, and ſtrong liquors either wholly let alone, or taken very ſparingly: the perſon muſt carefully avoid all violent paſſions of the mind, as anger, fear, and the like, and abſtain from all violent emotions of the body.

A contrary extreme to the thinneſs and watry appearance of the milk is a mucous thickneſs of it: this is principally troubleſome and dangerous to the parent, as it is apt to bring on tumours and nodes of the breaſt. The method of treatment in this caſe is to give gentle alexipharmics for ſome days: then the gentle laxative medicines in ſmall doſes, and finally allow a moderate uſe of wine.

Deficiency of milk is alſo a very common complaint, and it is in ſome caſes abſolute; there being no milk at all derived into the breaſts: in others, it is only a partial one; there being ſome milk, though not enough to ſupply the child with nouriſhment. A total deficiency of milk moſt frequently happens to thoſe who have their firſt child when ſomewhat advanced in years, and to ſuch as are of a cholerie diſpoſition; but a partial deficiency of it is often owing to a ſaltneſs of the ſerum, and ſometimes to the want of nouriſhments, and often is brought on by ſorrow. When ſaline and bilious humours are in fault, then lac lunæ, calcined cryſtal, and other abſorbent powders become of great uſe: ſome alſo preſcribe the powders of earth-worms carefully dried, and the voiding the humours by ſtool, by means of gentle purges: when the want of nouriſhment is the only occaſion of it, the milk may always be recovered in a proper quantity, by means of good foods with milk and other nouriſhing fluids.

An over-abundance of milk is as common a complaint as a deficiency of it, and requires as much care in the treatment of it, otherwiſe the perſon is frequently ſubject to nodes and abſceſſes in the breaſt: the proper remedies are the eating and drinking more ſparingly, and letting two children ſuck inſtead of one, together with thoſe methods already preſcribed in the milk-fever.

MILK *of Sulphur*. See SULPHUR.

MILL, a machine or engine for grinding corn, *&c.* of which there are ſeveral kinds, according to the various methods of applying the moving power; as water-mills, wind-mills, mills worked by horſes, *&c.*

In water-mills the momentum of the water is the moving power, and the attrition of the two ſtones in grinding, is the force to be overcome. Of theſe there are two kinds, *viz.* thoſe where the force of the water is applied above the wheel, and thoſe where it is applied below the wheel; the former being called over-ſhot, and the latter under-ſhot mills: and to theſe we may add a breaſt-mill, where the water ſtrikes againſt the middle of the wheel.

Some may imagine, that it is hardly worth while to write about ſo common a thing as a corn-mill; but the commonneſs of it ſhews its uſefulneſs, and therefore it would be unpardonable in us to paſs it over in ſilence.

Few people are ignorant, that corn is ground by two mill-ſtones, placed one above the other, without touching. The lower or nether mill-ſtone is immoveable, but the upper one turns upon a ſpindle. The oppoſite ſurfaces of the two ſtones, which act to grind the corn, are not plane or flat; but the upper one is hollow, and the under one ſwells up; each of them being of a conic figure, whoſe axis indeed is very ſhort in proportion

portion to the diameter of its baſe: for the upper one, being ſix feet in diameter, is hollowed but about one inch at its center; and the lower one riſes but about $\frac{1}{4}$ of an inch. Theſe two mill-ſtones come nearer and nearer towards their circumference, whereby the corn that falls from the hopper has room to inſinuate between them as far as $\frac{2}{3}$ of the radius, which is the place where it begins to be ground, and where it makes the greateſt reſiſtance that it is capable of; the ſpace between the ſtones being in that place about but $\frac{2}{3}$ or $\frac{3}{4}$ of the thickneſs of a grain of corn. But as the millers have the liberty of raiſing or ſinking the upper ſtone a little, they can proportion its diſtance from the lower one, according as they would have the flour finer or coarſer.

The circular motion of the upper mill-ſtone brings the corn out of the hopper by jerks, and cauſes it to recede from the center towards the circumference, where being quite reduced to flour, it is thrown out of the mill, by the centrifugal force of the ſtone, through a hole provided on purpoſe.

As the water acts upon an over-ſhot mill both by impulſe and weight, ſo does it likewiſe upon a breaſt-mill, or that where the water comes upon the breaſt or middle-part of the wheel: and here, though the weight of the water is not ſo great as in the overſhot mill, being contained in the buckets of the lower quarter only; yet the impulſe of the water is much greater, the height of the water being increaſed nearly the ſemi-diameter of the great wheel, all other things being equal. If the height of the water remain the ſame, the aperture of the penſtock muſt be enlarged to nearly twice the area, that the force may be the ſame; ſo that to produce the ſame effect, twice as much water is neceſſary for a breaſt mill as for an over-ſhot one, every thing elſe being the ſame.

As to the underſhot-mill, it is evident there can be only the impulſe from the water; and therefore, the height of the water remaining the ſame, there muſt be a larger aperture of the penſtock for the diſcharge of a greater quantity of water in the ſame time, in order to produce the ſame effect as in the overſhot or breaſt-mill: whence a greater expence of water will be made here than in any other mill, and can only be ſupplied for a conſtancy by a river; and where this can be had, the underſhot is the eaſieſt, cheapeſt, and moſt ſimple ſtructure a mill is capable of.

The diameter of common mill-ſtones, according to Dr. Deſaguliers, is from five to ſeven feet, and their thickneſs, twelve, fifteen, or eighteen inches: they laſt thirty-five or forty years; and when they have been long uſed, ſo that their thickneſs is conſiderably diminiſhed, they are cut anew.

Here follows the deſcription of an underſhot-mill, taken from Belidor's architecture hydraulique. A B (plate CLXXVI. n° 1.) is the underſhot-wheel, upon whoſe ſhaft D is fixed a ſpur or cog-wheel E, whoſe cogs take the rounds of the trundle or lantern G, which carries round the mill-ſtone in the hurſt or round frame I, containing the lower mill-ſtone at N N, and the upper one at V V; the axis, or ſpindle, fixed to the upper mill-ſtone being the iron-bar F H. They commonly make theſe ſort of underſhot-wheels from twelve to eighteen feet in diameter, the float-boards about two and a half or three feet long, and ten or twelve inches deep. The ſhaft is fifteen or eighteen inches in diameter; the cog-wheel, eight feet in diameter: it has forty-eight cogs four inches high, and three inches and a half wide. The lantern or trundle is made of two round pieces, or flat-heads, twenty-two inches in diameter, and four inches thick, in which are ſet nine rounds of two inches and a half diameter, and eighteen inches high. Through the trundle goes an iron axis, two inches and a half ſquare, and of a height proportionable to the ſituation of the mill-ſtones: it muſt be well faſtened to the upper mill-ſtone, and its lower end being reduced to a pivot, turns in a ſocket let into the ſupporting piece H. The ſection of a mill-hopper and drum that covers the mill-ſtones, is repreſented *ibid.* n° 2. The hopper is a ſmall trough A, with a ſpout B, to convey the corn out of the hopper into the aperture of the upper mill-ſtone, D D. The iron bar which paſſes through the trundle, is marked C, and the under mill-ſtone E E; the interval or ſpace between the ſtones being repreſented by the dark crooked line F F.

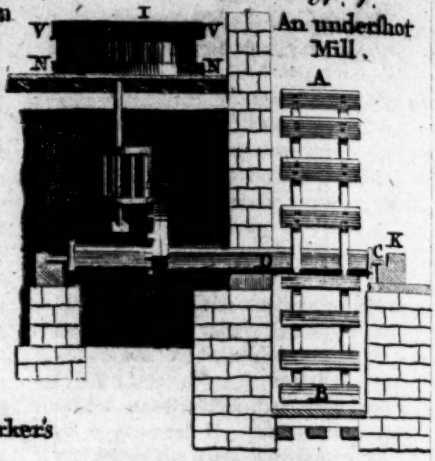
To this account of an underſhot-mill we ſhall add that of an over-ſhot one, wherein A B (*ibid.* n° 3.) is the axle-tree or ſhaft of the water-wheel, which has ſix arms C, C, &c. fixed in it at D. The

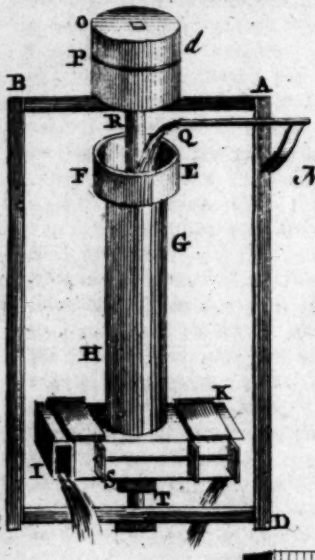
BRITISH MUSEUM

MILLS.

N.° 2. Section of a Mill Hopper Drum

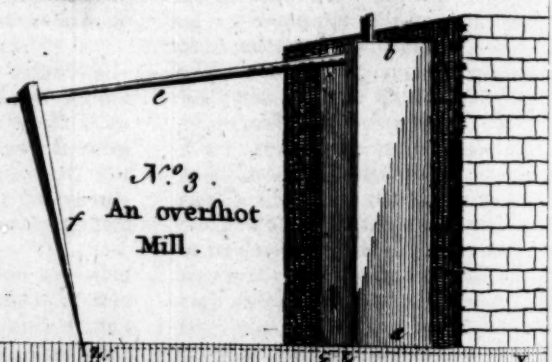
N.° 1. An undershot Mill.

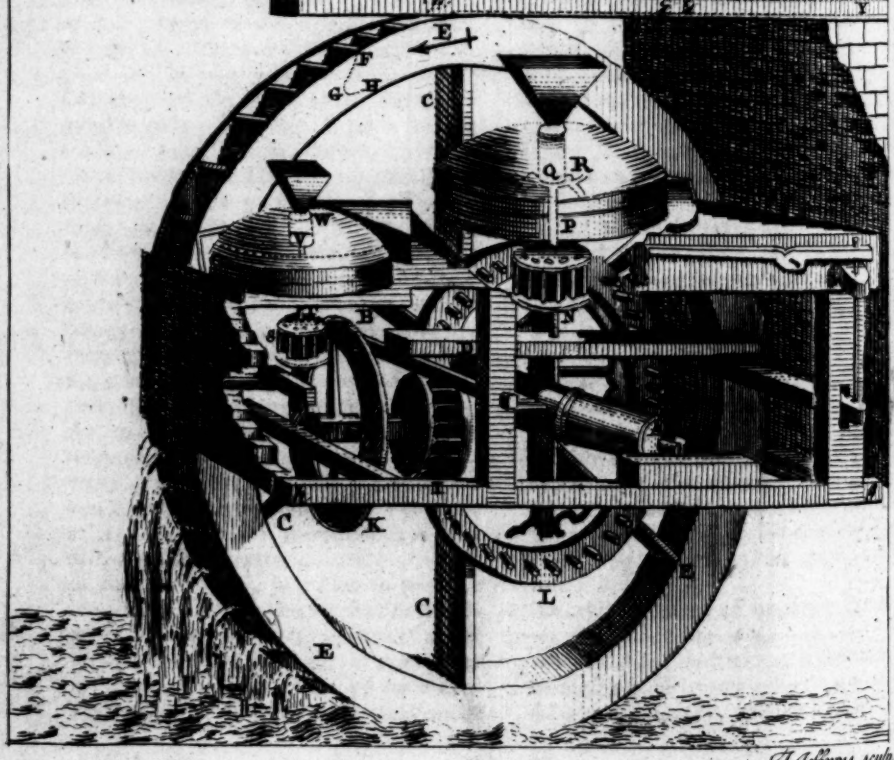




N.° 4. D.r Barker's Mill.

N.° 3. An overshot Mill.





T. Jefferys sculp.

BRITISH MUSEUM

Fig. 1. A Breast-Mill.

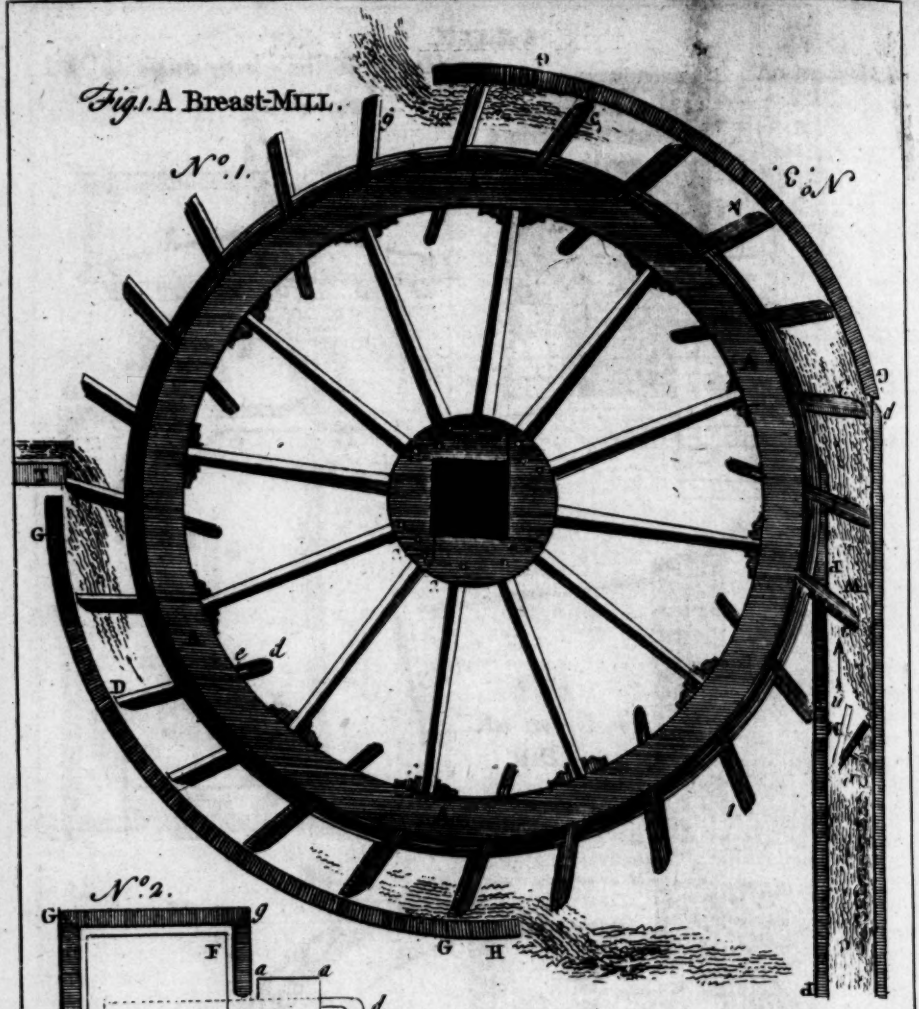


Fig. 2. the Cyder-Mill.

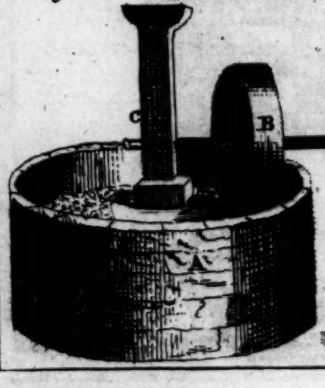
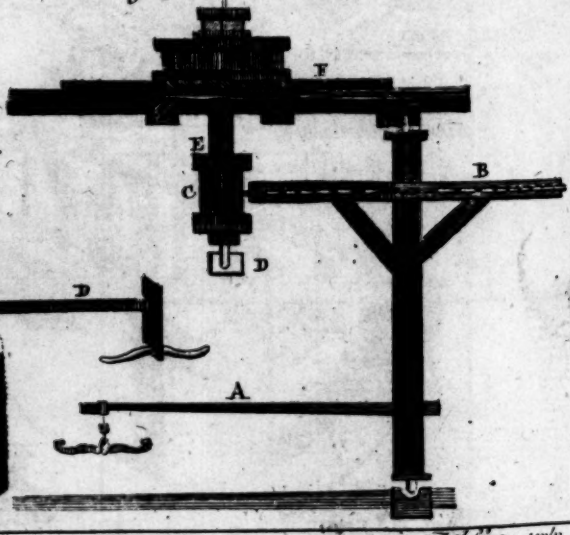


Fig. 3. A Horse-Mill.



T. Jefferys sculp

ſole of the wheel, marked EEE, is fixed, and contains thirty buckets, about eighteen inches broad, and fourteen inches deep; the elbow to the ſole, GH, being four inches. L, a cog-wheel placed on the ſame ſhaft by four arms at M, has forty-eight cogs, which turn the wallower, pinion, or trundle N, with nine rounds or leaves; and in this trundle is fixed an iron-ſpindle NQ, going through the middle of the lower mill-ſtone P, and turning the upper one R, by means of the rind Q.

I is another wallower or trundle, which is applied at pleaſure to the cog-wheel L; and on the ſame axis is another cog-wheel K, having forty cogs, which turn S a wallower of nine rounds; whoſe axis T has a rind V at its top, whereby it bears and turns the upper mill-ſtone W.

YZ is a trough or lander, which conveys the water from the pool or dam to the buckets of the wheel at Z. This has a penſtock *ab*, and an orifice *cd*, with a ſhuttle or ſluice to open or ſhut it; and is generally raiſed about two inches above the wheel, by means of a lever *e*, fixed to the ſhank by the handle *f*. The ſurface of the water in the pool muſt be conſiderably higher than the level of the top of the wheel.

Dr. Barker's new invented mill (*ibid.* n° 4.) is of the moſt ſimple ſtructure of any yet made, performing its effect without any wheel, trundle, cog, or round; the manner of whoſe operation may be eaſily underſtood from the following account of its ſeveral parts. ABCD is an upright frame, ſtanding on a proper baſe; EF is the wider part of GH, an upright hollow pipe or tube, fixed at the bottom to an horizontal ſquare trunk IK; which trunk, together with the tube, is fixed to an upright ſpindle or axis RS, by means of a nut and ſcrew at S. The lower end of the axis moves on a fine point in the pivot-hole, in the part of the frame at T. On the upper part of the frame is a hole through which the ſpindle paſſes, as alſo through the round circular piece P, fixed on the ſaid frame. On the upper part of the ſpindle is fixed another round piece O, which repreſents the upper mill-ſtone. Q is a ſpout of water filling the tube or trunk, and giving motion thereto; and conſequently to the axis and upper ſtone: by the horizontal jets of water from each end to the trunk IK, through holes made at each end on contrary ſides.

While the holes continue ſtopped, the trunk will be at reſt, becauſe then the preſſure is equal over all the parts; but when the holes are open, the preſſure of the water (by its having liberty to iſſue out) will be leſs on that part where the hole is, than on the other part oppoſite to it; which ſtronger preſſure will prevail, and carry round the trunk and tube with the axle and ſtone, in a contrary direction; and each hole contributes to produce this motion, which will be greater or leſſer in proportion to the momenta of the jets of water, or greater or leſſer aperture of the holes.

For it is eaſy to underſtand, that the power of this machine is derived from, or depends upon, three things: 1. The velocity of the ſpouting-water. 2. The quantity thereof. And, 3. The diſtance at which the water ſpouts from the axis of motion. The two firſt make the momentum ariſing from the preſſure of the fluid, which is proportional to the altitude or height of the tube; the laſt is of a mechanical nature, for the trunk is, in this reſpect, exactly of the nature of the lever.

When the quantity of water is not ſufficient to turn an underſhot-wheel, and there is not height enough for an overſhot one, the water is made to fall into the buckets of a breaſt-wheel, as it is called, (ſee plate CLXXVII. fig. 1.) about the height of the center of the ſhaft, and to work by its weight till it gets to the bottom, thro' the channel TGD.

The late ingenious Dr. Barker contrived one of theſe, which, notwithſtanding the diſadvantage already hinted, fell little ſhort of an overſhot one. The wheel AAA is nineteen feet in diameter, with twelve arms and twenty-four ladle-boards, which receive the water a little above the horizontal diameter of the wheel, at T, and do not part with it till they come to the loweſt part of the wheel. To effect this, there is a circular channel GGH, the ſection of which *g g* GG, (*ibid.* fig. 2.) made by a plane paſſing through the wheel's center, is every where eighteen inches ſquare: the ladle-boards, FF, (*ibid.*) nearly fill this channel, ſo as to juſt paſs down without touching it. D*d* is the ſupporter of the ladle-board, with a hole near *d* to drive a key or wedge on the inſide of the ſole of the wheel, *aaaa*, to hold faſt this piece together with the ladle-board.

Of all the water-mills that have hitherto

been thought of, there are none more ingenious or ſimple than thoſe which have been invented at Toulouſe in Languedoc; the deſcription of which, taken from Belidor, is as follows.

There are ſixteen mills a-breaſt which go continually, and which ſerve both the city and county around it with flour: but as they are all equally acted upon by the current, and are independent of one another, we ſhall only deſcribe three of them.

Plate CLXXVIII. fig. 1. ſhews the plan of ſeveral pieces of maſon work that ſerve as piers to ſeveral arches which ſhut with ſluices, and are repreſented in fig. 4. which is an elevation took upon the length A B. Every ſluice anſwers to a channel 7, faced with maſon-work, and which grows narrower continually till it comes to C D, where it terminates at a cylindrical veſſel C E D without any bottom, which is likewiſe of ſtone-work: the water which is confined behind the ſluice 5, and paſſing through the hole 22, enters with great velocity into the channel, and not finding ſo large a paſſage to run out by as that by which it entered, it ſwells and falls with the greater force into the cylinder, forming a whirlpool, and turns a horizontal wheel at the bottom of it, which is repreſented at F. The axle I of this wheel terminates at the mill-ſtone K, fig. 2. The water, when it has run round ſeveral times in the cylinder, and ſtruck the ladles of the wheel, runs out again by the openings left betwixt theſe ladles at the bottom of the cylinder, and goes off on the underſide by a ſlope. This may ſerve to give a general idea of the conſtruction of theſe mills, which we ſhall now deſcribe more particularly.

The wheel has a pivot which is fixed in the ſocket made in the reſting place N, (fig. 2.). This reſting place is ſupported at V by a threſhold into which it is morticed; the extremity of it, X, is fixed by an iron-pin to the beam O, ſuſpended by the lever P Q, (fig. 2.) ſupported at one end P, and ſuſpended at the other to the beam Q R, pierced at the top with ſeveral holes to receive an iron-pin: and as all the different pieces move together, when the extremity R is lifted up or let down, the wheel F may be raiſed or lowered on purpoſe to bring the upper mill-ſtone K near to the under one, as is uſual in common mills.

The height of the cylinder is expreſſed by L M, and you may ſee, on the ſide where the water runs off, the maſon-work of which it is compoſed, and which is ſupported by theſe beams M and T. There is in this part an arch S behind each cylinder, which cannot be well diſtinguiſhed but in fig. 3. which is an elevation of the mill upon the line Q R, where you may diſtinguiſh the different parts on the inſide from the place where the water enters to where it runs out. And to know them you have only to ſeek for the different figures and letters of the ſeveral plates, which ſhow the relation of the parts to one another, in the different points of view. The maſonry of the cylinders is founded upon carpenter's work: for as the water paſſes underneath, it was neceſſary to build them in the air, and to ſupport them on the piers Y, *y*.

Theſe mills are ſo diſpoſed, that all the parts belonging to one, may be taken to pieces without hindering the going of any of the reſt, when there is any repairs to be made, as every one has its own channel, which needs only to ſhut to be at liberty of working both above and below.

As there is only five feet four inches (almoſt ſix feet Engliſh) from the center of one mill-ſtone to another, you may build twelve mills upon a river of ten or twelve fathoms in breadth, whereas uſually they only make four, and moreover they are obliged to build on both ſides: in this kind, as there is neither cog-wheel nor trundle-head, nor any friction beſides that of the pivot of the wheel, they ſeldom want repairs. The wheel is three feet in diameter and is made of one piece of the body of a tree, and the ladles are cut out on it, which are inclined on its thickneſs, and made ſomewhat bending, as you may ſee on the figure.

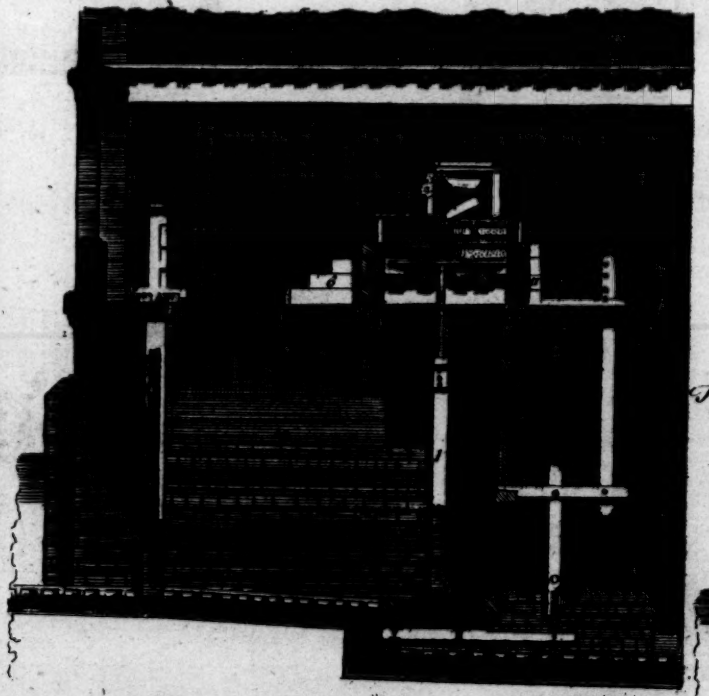
There might be ſeveral curious enquiries made for the improving this wheel; we ſhall only mention, that the water which turns it moves it with a force compounded of its weight and the circular direction which it receives from the cylinder: the bending of the ladles ought to be circular, and the inclination which they have from top to bottom ought to make an angle of 54° 44′ with the axle of the wheel, ſince it is the ſame caſe as the ſails of a wind-mill.

Hand MILL, or *horſe* MILL, that worked by the hand, or by horſes, *&c.* A (plate CLXXVII. fig. 3.) the long beam of

MILLS with Horizontal Water-Wheels

Fig. 1. A Plan of their Mason-Work, &c.

Fig. 2. A Section taken on the Line GH.



A Scale of 12 Paris Feet

Fig. 3. A Profile and Elevation taken on the Line QR.

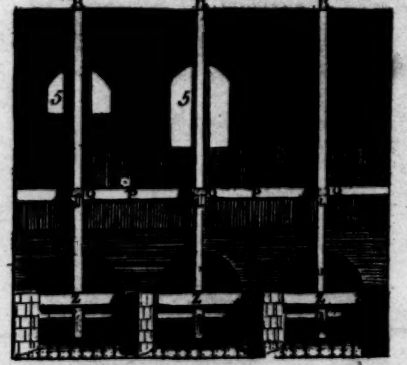


Fig. 4. An Elevation taken on the Line AB.

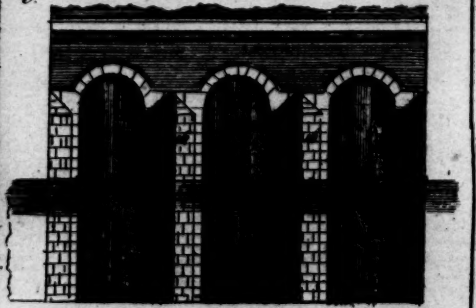


Plate CLXXVIII

BRITISH MUSEUM

BRITISH
MUSEUM

Fig. 1. An Elevation of A Powder-Mill.

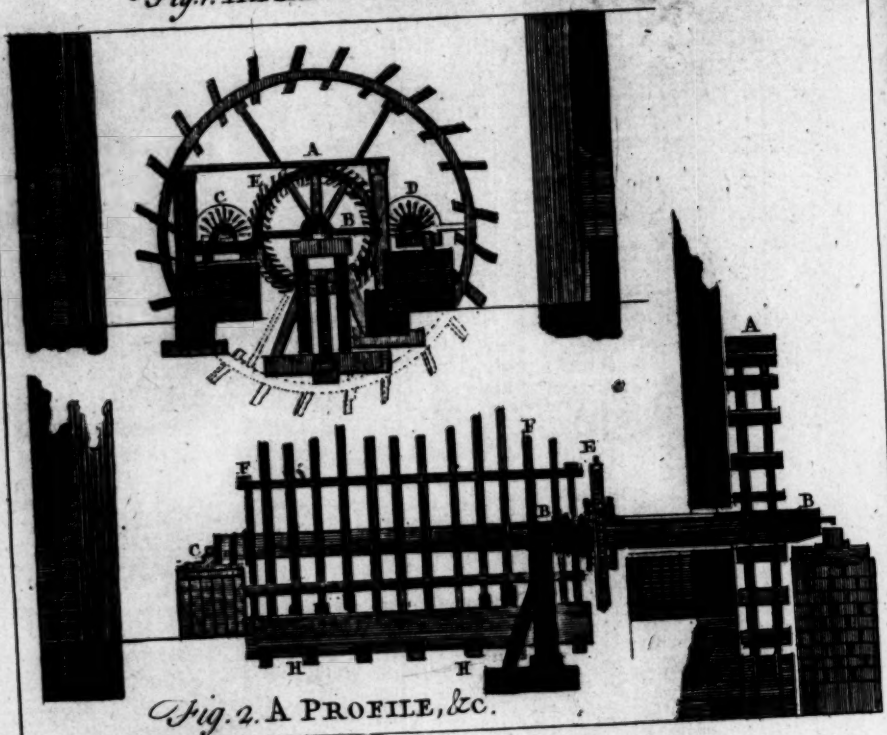
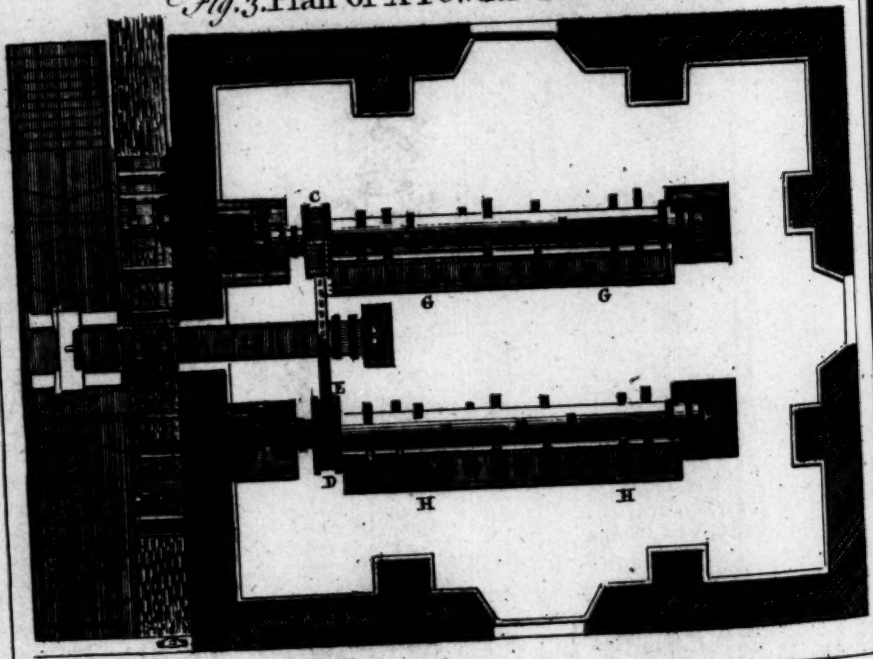


Fig. 2. A PROFILE, &c.

Fig. 3. Plan of A Powder-Mill.



T. Jefferys Sc.

lever for moving it, may be double, triple, or quadruple, ſo as to receive ſeveral men or horſes, to drive ſeveral mills at once. B is the cog wheel, placed horizontally, with pins fixed, not on its plane, but on the outſide, at the circumference of the joints. The trundle-head is marked C, the ſupport D, the iron-axis E, and the drum where the mill-ſtones are incloſed F.

MILL is alſo uſed for any machine, which being moved by ſome external force, makes a ſtrong impreſſion on things applied thereto: ſuch are fulling-mills, paper-mills, mills uſed in coining, gun-powder-mills, oil-mills, ſtamping-mills, ſugar-mills, &c. See FULLING, PAPER, COINING, &c.

Cyder-MILL. The cyder-mill (*ibid.* fig. 2.) conſiſts of a large round trough, A; into which the apples are thrown, and there reduced to a pulp, by means of the wooden wheel, B, whoſe axis, D, is faſtened to a turning beam, C, and turned round by a horſe. When the apples are thus reduced to pulp, they are put into the cyder-preſs. See the article PRESS.

Gun-powder MILL, is that uſed for pounding and beating together the ingredients whereof gun-powder is compoſed. See the article GUN-POWDER.

Theſe ingredients being duly proportioned and put into the mortars of the mill, which are hollow pieces of wood, each capable of holding twenty pounds of paſte, are incorporated by means of the peſtles and ſprinkling. There are twenty-four mortars in each mill, where are made each day 480 pounds of gun-powder; care being taken to ſprinkle the ingredients in the mortars with water, from time to time, leſt they ſhould take fire. The peſtle is a piece of wood ten feet high and 4 ½ inches broad, armed at bottom with a round piece of metal. It weighs about ſixty pounds.

But the operation of this mill will be better conceived from an inſpection of its ſeveral parts. Plate CLXXIX. fig. 1. repreſents the plan of the water wheel and trundle-heads; where A is the wheel, B its arbor; C, D, the two trundle-heads, each turning with their proper arbor; E the cog-wheel driven by the arbors of the great wheel, and inſerting its teeth between the ſpindles of the trundle-heads, makes one of them turn one way and the other another way.

Fig. 2. *ibid.* is the profile of the great wheel and cog-wheel, marked A and E; where B B is the arbor of the great wheel, C the arbor of the trundle-head C, F F the peſtles, and H H the outſides of the mortars.

Fig. 3. *ibid.* is a plan of the whole machine; A being the great wheel; B its arbor; C, D, the trundle-heads, each with its proper arbor; called here canting-wheel; being each environed with twelve ſmall pieces of wood, called lifts, jutting out to raiſe the peſtles. E is the cog-wheel; G G the tails of the peſtles, and H H the bottoms of the mortars.

If water be given to the great wheel, the cog-wheel muſt likewiſe move and drive contrary ways the two trundle-heads and their canting-wheels; and each lift, turning with the canting-wheels, meets with the ſtay of a peſtle, and lets it fall into its mortar. Theſe twelve lifts are diſpoſed in ſuch a manner, that there is always four of them up, and four peſtles unequally ready to fall, ſo that only one of them falls at a time; and on this diſpoſition of the peſtles depends the equality of the trituration, which ſucceeds ſtill better, by making the paſte paſs thro' the ſeveral mortars at regular times.

MILL *for iron-work*. See SMITHERY.

Sawing MILL. See the article SAWING.

Sugar-MILL. See the article SUGAR.

Tanning-MILL. See TANNING-MILL.

MILL-POOL, a ſtock or pond of water, by the force of which the motion of a water-mill is effected.

The dam of a mill pool is raiſed much in the ſame manner as directed for fiſh-ponds. See the article FISH-POND.

MILL-STONE, that uſed in mills, for grinding; being uſually made of ſeveral ſpecies of pſaduria, or free ſtone. See the article PSADURIA.

MILLAND, or MILHAND, a town of Guienne in France, ſixty miles north-weſt Montpelier.

MILLENARIANS, or CHILIASTS, a name given to thoſe, who, in the primitive ages, believed that the ſaints will one day reign on earth with Jeſus Chriſt a thouſand years. The former appellation is of latin original, the latter of Greek, and both of the ſame import.

The millenarians held, that after the coming of antichriſt, and the deſtruction of all nations, which ſhall follow, there ſhall be a firſt reſurrection of the juſt alone: that all who ſhall be found upon earth, both good and bad, ſhall continue alive; the good, to obey the juſt who are

riſen, as their princes; the bad, to be conquered by the juſt, and to be ſubject to them: that Jeſus Chriſt will then deſcend from heaven in his glory: that the city of Jeruſalem will be rebuilt, enlarged, embelliſhed, and its gates ſtand open night and day. They applied to this new Jeruſalem, what is ſaid in the Apocalypſe, ch. xxi. and to the temple, all that is written in Ezekiel xxxvi. Here, they pretended Jeſus Chriſt will fix the ſeat of his empire, and reign a thouſand years with the ſaints, patriarchs and prophets, who will enjoy perfect and uninterrupted felicity.

This reign of our Saviour on earth is uſually ſtyled the millenium, or reign of a thouſand years.

MILLEPES, the common WOOD-LOUSE, a ſpecies of the oniſcus with a blunt forked tail. See the article ONISCUS.

Its body is ſhort and broad, approaching to an oval figure; it grows to near half an inch in length, and about half its length in diameter; its back is ſomewhat rounded, the belly flat; the colour a bluiſh grey; and the legs are ſeven or eight on each ſide, but the more uſual number is ſeven. It runs nimbly, and on being touched rolls itſelf up to a kind of ball. It is common about old trees, and under logs of wood and ſtones.

The beſt way of taking theſe animals, is ſwallowing them alive; for as they roll themſelves into a kind of pill, they eaſily ſlip down the throat untaſted, and are immediately deſtroyed on falling into the ſtomach: this is the ſureſt way of having all their virtues; the next to this is bruiſing them in wine, and taking the expreſſion. They are ſometimes dried, and given in powder, but in this ſtate they loſe the greater part of their virtues; however, if the patient can be prevailed on to take them no other way, the beſt method of preparing them, is that ordered in the New London Diſpenſatory, which is the tying them up in a thin canvas-cloth, and ſuſpending them within a covered veſſel, over the ſteam of hot ſpirit of wine; they are ſoon killed by this vapour, and rendered friable.

Millipedes are aperient, attenuant, and detergent; they diſſolve viſcous humours, are good in all obſtructions of the viſcera, and have even been celebrated by ſome writers as a remedy for the ſtone, which it is pretended they have a power of reducing to a mucilage, and carrying off. They are often found to be of ſervice in aſthmas, and great good has been ſometime done by a long courſe of them in diſorders of the eyes.

MILLERIA, a genus of the ſyngeneſia-polygamia claſs of plants, the compound flower of which is radiated; there is ſcarce any viſible receptacle of the ſeeds, which are ſingle after each particular flower, and have no pappus or down.

MILLET, *milium*, in botany, a genus of the triandria digynia claſs of plants, the calyx of which is a bivalve glume; the corolla is bivalve, ſhorter than the cup, and grows to the ſeed, which is ſingle and roundiſh.

Millet-ſeed is accounted refrigerant and drying, and recommended in fluxes: it is alſo ſaid to promote ſweat and urine very powerfully.

MILLING, in the manufacture of cloth, the ſame with fulling. See FULLING.

Milling of ſilk, is an operation otherwiſe called throwing.

MILLION, in arithmetic, the number of ten hundred thouſand, or a thouſand times a thouſand. See the article NUMBER and NUMERATION.

MILLREE, a Portugueſe gold-coin. See the article COIN.

MILO, or MELO, one of the iſlands of the Archipelago, ſixty miles north of Candia.

MILT, in anatomy, a name ſometimes given to the ſpleen. See SPLEEN.

MILT, or MELT, is alſo a denomination by which ſome call the rows of fiſhes.

MILTENBERG, a town of Germany, eighteen miles ſouth of Aſchaffenberg.

MILTON, the name of ſeveral market-towns, as one twelve miles north-eaſt of Dorcheſter, and another twelve miles north-eaſt of Maidſtone.

MILVUS, the KITE, in ornithology, a ſpecies of falcon, with a forked tail, a yellow cera, a brown body, and a whitiſh head. It is a very common bird with us, about the ſize of a large tame pigeon. See the article FALCON and KITE.

MILVUS, in ichthyology, the ſame with the hirundo piſcis, or ſwallow-fiſh. See the article HIRUNDO.

MIME, μιμος, in the antient comedy, a perſon who acted any character by mere geſtures, and hence denominated pantomime. See the article PANTOMIME.

MIMESIS, μιμησις, in rhetoric, the imitating the voice and geſtures of another perſon.

MIMOSA, the SENSITIVE PLANT, in botany. See the article SENSITIVE.

MIMULUS

MIMULUS, in botany, a genus of the didynamia-angiospermia class of plants, with double stigmata, and a ringent monopetalous flower; the fruit is a bilocular capsule, with several seeds in each cell.

MIMUSOPS, in botany, a genus of the octandria-monogynia class of plants, the corolla of which consists of eight petals; and its fruit is a drupe.

MINA, in grecian antiquity, a money of account, equal to an hundred drachms. See MONEY and DRACHM.

MINCIO, or MENZO, a river of Italy, which, after running through the dutchy of Mantua, discharges itself into the Po, at Borgoforte.

MIND, *mens*, *νους*, a thinking intelligent being, otherwise called spirit, in opposition to matter or body. See the articles BODY and SPIRIT.

The culture of the human mind is more immediately taught in the sciences of logics and ethics. See LOGIC and ETHICS.

When the mind, says Mr. Locke, turns its view inwards upon itself, thinking is the first idea that occurs; wherein it observes a great variety of modifications, whence it frames to itself distinct ideas. See IDEA.

Thus the perception annexed to any impression on the body by an external object, is called sensation; when an idea recurs without the presence of the object, it is called remembrance; when sought after by the mind, and brought again into view, it is recollection; when the ideas are taken notice of, and as it were registered in the memory, it is attention; when the mind fixes its view on any one idea, and considers it on all sides, it is called study.

MINDANAO, the largest of the Philippine islands, except Luconia, is situated between 120° and 126° east longitude, and between 5° and 10° north lat.

MINDELHEIM, a city of Germany, thirty-three miles south east of Ulm. It is the capital of the principality of Mindelheim, conferred on the duke of Marlborough, by the emperor in 1704.

MINDEN, a city of Germany, the capital of a dutchy of the same name, situated forty miles west of Hanover.

MINDORA, one of the Philippine islands, lies south-west of Luconia, from which it is situated by a narrow channel.

MINE, in natural history, a place under ground, where metals, minerals, or even precious stones are dug up. See the article DIGGING.

As, therefore, the matter dug out of mines is various, the mines themselves acquire various denominations, as gold-mines, silver-mines, copper-mines, iron-mines, diamond-mines, salt-mines, mines of antimony, of alum, &c. See the articles GOLD, SILVER, &c.

Mines, then, in general, are veins or cavities within the earth, whose sides receding from, or approaching nearer to, each other, make them of unequal breadths in different places, sometimes forming larger spaces, which are called holes: they are filled with substances, which, whether metallic or of any other nature, are called the loads; when the substances forming these loads, are reducible to metal, the loads are by the miners said be alive; otherwise they are called dead loads. In Cornwal and Devon, the loads always hold their course from eastward to westward; though in other parts of England, they frequently run from north to south. The miners report, that the sides of the load never bear in a perpendicular, but constantly under-lay, either to the north or to the south. The load is frequently intercepted by the crossing of a vein of earth, or stone, or some different metallic substance; in which case it generally happens that one part of the load is moved a considerable distance to the one side. This transient load is by the miners called flooking: and the part of the load which is to be moved, is said to be heaved. See the article FLOOKING.

According to Dr. Nichols's observations upon mines, they seem to be, or to have been, the channels through which the waters pass within the earth, and, like rivers, have their small branches opening into them, in all directions. Most mines have streams of water running through them; and when they are found dry, it seems to be owing to the waters having changed their course, as being obliged to it, either because the load has stopped up the antient passages, or that some new and more easy ones are made.

Mines, says Dr. Shaw, are liable to many contingencies; being sometimes poor, sometimes soon exhaustible, sometimes subject to be drowned, especially when deep, and sometimes hard to trace; yet there are many instances of mines proving highly advantageous for hundreds of years: the mines of Potosi are to this day worked with nearly the same success as at first; the gold-mines of Cremnitz have been worked almost these thousand years; and our cornish tin-mines are extremely antient.

antient. The neat profit of the ſilver alone, dug in the miſnian ſilver-mines in Saxony, is ſtill, in the ſpace of eight years, computed at a thouſand ſix hundred and forty-four millions, beſides ſeventy-three tons of gold. Many mines have been diſcovered by accident: a torrent firſt laid open a rich vein of the ſilver-mine at Friberg in Germany; ſometimes a violent wind, by blowing up trees, or overturning the parts of rocks, has diſcovered a mine; the ſame has happened by violent ſhowers, earthquakes, thunder, the firing of woods, or even the ſtroke of a plough-ſhare, or horſe's hoof.

But the art of mining does not wait for theſe favourable accidents, but directly goes upon the ſearch and diſcovery of ſuch mineral veins, ores, or ſands, as may be worth the working for metal. The principal inveſtigation and diſcovery of mines depend upon a particular ſagacity, or acquired habit of judging from particular ſigns, that metallic matters are contained in certain parts of the earth, not far below its ſurface. The principal ſigns of a latent metallic vein, ſeems reducible to general heads, ſuch as, 1. The diſcovery of certain mineral waters. 2. The diſcolouration of the trees or graſs of a place. 3. The finding of pieces of ore on the ſurface of the ground. 4. The riſe of warm exhalations. 5. The finding of metallic ſands, and the like. All which are ſo many encouragements for making a ſtricter ſearch near the places where any thing of this kind appears; whence rules of practice might be formed for reducing this art to a greater certainty. But when no evident marks of a mine appears, the ſkilful mineraliſt uſually bores into the earth, in ſuch places as from ſome analogy of knowledge, gained by experience, or by obſerving the ſituation, courſe, or nature of other mines, he judges may contain metal: this method of boring we have already given under the article BORING.

After the mine is found the next thing to be conſidered, is whether it may be dug to advantage. In order to determine this, we are duly to weigh the nature of the place, and its ſituation, as to wood, water, carriage, healthineſs, and the like, and compare the reſult with the richneſs of the ore, the charge of digging, ſtamping, waſhing, and ſmelting. See STAMPING, WASHING, and SMELTING. Particularly the form and ſituation of the ſpot ſhould be well conſidered. A mine muſt either happen, 1. In a mountain. 2. In a hill. 3. In a valley. Or, 4. in a flat. But mountains and hills are dug with much greater eaſe and convenience, chiefly becauſe the drains and burrows, that is the adits or avenues may be here readily cut, both to drain the water and to form gang-ways for bringing out the lead, *&c.* In all the four caſes we are to look out for the veins which the rains, or other accidental thing, may have laid bare; and if ſuch a vein be found, it may often be proper to open the mine at that place, eſpecially if the vein prove tolerably large and rich: otherwiſe the moſt commodious place for ſituation is to be choſe for the purpoſe, *viz.* neither on a flat, nor on the tops of mountains, but on the ſides. The beſt ſituation for a mine, is a mountainous, woody, wholſome ſpot; of a ſafe eaſy aſcent, and bordering on a navigable river. The places abounding with mines are generally healthy, as ſtanding high, and every where expoſed to the air; yet ſome places, where mines are found, prove poiſonous, and can, upon no account, be dug, though ever ſo rich: the way of examining a ſuſpected place of this kind, is to make experiments upon brutes, by expoſing them to the effluvia or exhalations to find the effects.

For the different veins, and the manner of tracing them, ſee the articles VEIN, and METALS.

Devonſhire and Cornwal, where there are a great many mines of copper and tin, is a very mountainous country, which gives an opportunity in many places to make adits, or ſubterraneous drains, to ſome valley at a diſtance, by which to carry off the water from the mine, which otherwiſe would drown them out from getting the ore. Theſe adits are ſometimes carried a mile or two, and dug at a vaſt expence, as from 2 to 4000 l. eſpecially where the ground is rocky; and yet they find this cheaper than to draw up the water out of the mine quite to the top, when the water runs in plenty, and the mine is deep. Sometimes, indeed, they cannot find a level near enough, to which an adit may be carried from the very bottom of the mine; yet they find it worth while to make an adit at half the height to which the water is to be raiſed, thereby ſaving half the expence; where being delivered into the trough L Z (pl. CLXXX. fig.

fig. 1.) it runs off under ground, without being drawn up to the mouth of the mine.

The late Mr. Coſtar, conſidering that ſometimes from ſmall ſtreams, and ſometimes from little ſprings, or collections of rain-water, one might have a pretty deal of water above ground, though not a ſufficient quantity to turn an overſhot-wheel, thought that if a ſufficient fall might be had, this collection of water might be made uſeful in raiſing the water in a mine to the adit, where it may be carried off. The fall to be had, appeared to him to be C L *(ibid.)* the height of the mouth of the mine down to the adit, which we ſhall here ſuppoſe twenty-five yards. Then he contrived to place a rag-wheel R R, with its chain or bucket-pump, at the mouth of the mine C *c*, as repreſented in the figure; receiving the water, collected in the ciſtern W, thro' the pipe A, conveying it into the buckets B, making them go the reverſe way (becauſe in the common chain-pump, the rag wheel carries the buckets, but here the buckets carry the rag wheel) down as far as the adit, into which they diſcharge themſelves at *b b*; where turning another rag-wheel *r r*, whoſe axis works an engine that brings the water from the bottom, and delivers it into the adit L Z, which carries away both the waters to the opening at the bottom of the mountain, which we ſuppoſe at a great diſtance from the mine.

Any kind of engine may be worked by this lower rag-wheel, whoſe axis is H I *(ibid.)* as, for example, a common chain pump, by making the rag-wheel ſufficiently deep; or cranks, as repreſented at G *g*, working two pump-rods K, K, moving in the barrels M, M, and delivering their water into the trough L Z, leading to the adit.

N. B. There muſt be a wheel fixed to the axis of the upper rag-wheel at C, to carry a pinion or ſmaller wheel D, having a fly E F; in order to regulate the motion of the whole machine, and prevent jerks.

One conſiderable advantage may be reaped from a great fall of a ſmall quantity of water, by fixing Dr. Barker's breaſt-wheel a little above the adit-ciſtern under ground. Let plate CLXXVII. fig. 1. be inverted, as at n° 3. *ibid.* and P P *p p* repreſents the bottom of a ſquare perpendicular trough, that conveys the water to the mouth of the circular channel G G, where the ladle-boards run in the direction 3, 4, 5, and quit the water at 6. A chain C *o*, pulling the ſhuttle M *n*, lets down the water upon the ladle-boards, in proportion to its quantity. The axis of this wheel, in going round, may be made to move any kind of water-work, to bring up the water from the bottom of a mine into the adit, there to be carried off.

MINE, in the military art, denotes a ſubterraneous canal, or paſſage, dug under the wall or rampart of a fortification, intended to be blown up by gun-powder.

The alley or paſſage of a mine is commonly about four feet ſquare; at the end of this is the chamber of the mine, which is a cavity about five feet in width and in length, and about ſix feet in height; and here the gun-powder is ſtowed. The fauciſſe of the mine, is the train, for which there is always a little aperture left. There are various kinds of mines, which acquire various names, as royal mines, ſerpentine-mines, forked-mines, according as their paſſages are ſtraight, oblique, winding, *&c.* There are alſo mines made in the field, which are called fougades. See the article FOUGADE.

Mines are either dug within the body of the earth, as thoſe made by the beſieged to blow up the works of the beſiegers, before they make a lodgment on the covered way; or in eminences and riſing grounds, as to make a breach in the ramparts, *&c.* or to blow up walls, or laſtly, to tear up rocks.

Two ounces of powder have been found, by experiment, capable of raiſing two cubic feet of earth; conſequently two hundred ounces, that is twelve pounds eight ounces, will raiſe two hundred cubic feet, which is only ſixteen feet ſhort of a cubic toiſe, becauſe two hundred ounces joined together, have proportionably a greater force than two ounces, as being an united force. See the article GUN-POWDER.

All the turnings a miner uſes to carry on his mines, and through which he conducts the fauciſſe, ſhould be well filled with earth and dung; and the maſonry in proportion to the earth to be blown up, as 3 to 2. The entrance of the chamber of the mine ought to be firmly ſhut with thick planks, in the form of a St. Andrew's croſs, ſo that the encloſure be ſecure, and the void ſpaces ſhut up with dung, or tempered earth. If a gallery be made below, or on the ſide of the chamber,

chamber, it muſt abſolutely be filled up with the ſtrongeſt maſonry, half as long again as the height of the earth; for this gallery will not only burſt, but likewiſe obſtruct the effect of the mine. The powder ſhould always be kept in ſacks, which are opened when the mine is charged, and ſome of the powder ſtrewed about: the greater the quantity of earth to be raiſed is, the greater is the effect of the mine, ſuppoſing it to have the due proportion of powder. Powder has the ſame effect upon maſonry as upon earth, that is, it will proportionably raiſe either, with the ſame velocity.

The branches which are carried into the ſolidity of walls, do not exceed three feet in depth, and two feet ſix inches in width nearly; this ſort of mine is moſt excellent to blow up the ſtrongeſt walls.

The weight of a cubic foot of powder ſhould be 80 lb. one foot one inch cube will weigh 100 lb. and one foot two inches and eleven twelfths, 150 lb. and 200 lb. of powder will be one foot five inches cube; however, there is a diverſity in this, according to the quantity of ſalt peter in the gun-powder.

If, when the mines are made, water be found at the bottom of the chamber, planks are laid there, on which the powder is placed either in ſacks or barrels, of 100 lb. each. The ſauciſſe muſt have a clear paſſage to the powder, and be laid in an auget, or wooden trough, through all the branches. When the powder is placed in the chamber, the planks are laid to cover it, and others again acroſs theſe; then one is placed over the top of the chamber, which is ſhaped for that purpoſe: between that and thoſe which cover the powder, props are placed, which ſhore it up; ſome inclining towards the outſide, others to the inſide of the wall; all the void ſpaces being filled with earth, dung, brick, and rough ſtones. Afterwards planks are placed at the entrance of the chamber with one acroſs the top, whereon they buttreſs three ſtrong props, whoſe other ends are likewiſe proped againſt another plank ſituated on the ſide of the earth in the branch; which props being well fixed between the planks with wedges, the branch ſhould then be filled up to its entrance with the forementioned materials. The ſauciſſes which paſs through the ſide branches muſt be exactly the ſame length with that in the middle, to which they join: the part which reaches beyond the entrance of the mine, is that which conveys the fire to the other three; the ſauciſſes being of equal length will ſpring together.

From a great number of experiments, it appears, 1. That the force of a mine is always towards the weakeſt ſide; ſo that the diſpoſition of the chamber of a mine does not at all contribute to determine this effect. 2. That the quantity of powder muſt be greater or leſs, in proportion to the greater or leſs weight of the bodies to be raiſed, and to their greater or leſs coheſion; ſo that you are to allow for each cubic fathom

Of looſe earth,	9 or 10 lb.
Firm earth and ſtrong ſand,	11 or 12
Fat clayey earth,	15 or 16
New maſonry, not ſtrongly bound,	15 or 20
Old maſonry, well bound,	25 or 30

3. That the aperture, or entonnoir of a mine, if right charged, is a cone, the diameter of whoſe baſe is double the height taken from the center of the mine. 4. That when the mine has been overcharged, its entonnoir is nearly cylindrical, the diameter of the upper extreme not much exceeding that of the chamber. 5. That beſides the ſhock of the powder againſt the bodies it takes up, it likewiſe cruſhes all the earth that borders upon it, both underneath and ſideways.

To charge a mine ſo as to have the moſt advantageous effect, the weight of the matter to be carried muſt be known; that is, the ſolidity of a right cone, whoſe baſe is double the height of the earth over the center of the mine: thus having found the ſolidity of the cone in cubic fathoms, multiply the number of fathoms by the number of pounds of powder neceſſary for raiſing the matter it contains; and if the cone contains matters of different weights, take a mean weight between them all, always having a regard to their degree of coheſion.

As to the diſpoſition of mines, there is but one general rule, which is, that the ſide towards which one would determine the effect be the weakeſt, but this varies according to occaſions and circumſtances.

The calculation of mines is generally built upon this hypotheſis, that the entonnoir of a mine is the fruſtum of an inverted cone, whoſe altitude is equal to the radius of the excavation of the mine, and the diameter of whoſe leſſer baſe is equal to the line of leaſt reſiſtance; and though

though theſe ſuppoſitions are not quite exact, yet the calculation of mines deduced from them have proved ſucceſsful in practice; for which reaſon this calculation ſhould be followed, till a better and more ſimple be found out.

M. de Valliere found that the entonnoir of a mine was a paraboloid, which is a ſolid generated by the rotation of a ſemi-parabola about its axis; but as the difference between theſe two is very inſignificant in practice, that of the fruſtum of a cone may be uſed. See the article PARABOLOIDES.

Knight of the MINE, a military honour anciently conferred on perſons who had diſtinguiſhed themſelves in engagements in mines.

MINE *Ships*, ſhips filled with gun-powder, incloſed in ſtrong vaults of ſtone or brick, to be fired in the midſt of an enemy's fleet.

MINEHEAD, a borough and port-town of Somerſetſhire, which ſends two members to parliament: weſt long. 3° 20′, north lat. 51° 18′.

MINERAL, in natural hiſtory, is uſed, in general, for all foſſil bodies, whether ſimple or compound, dug out of a ſubterraneous mine, from which it takes its denomination. See FOSSIL and MINE. In this ſenſe, metals, ſulphurs, foſſil ſalts, ſemi-metals, *&c.* are minerals. See the articles METALS, SULPHUR, *&c.*

Boerhaave defines minerals natural bodies, found either in the bowels or on the ſurface of the earth, of ſo ſimple a ſtructure that the cloſeſt inſpection, even by the beſt microſcopes, has not been able to diſcover any diverſity between the veſſels and their contents; but each part appears ſimilar to the whole, though in many of them there certainly is a compoſition of ſolid and fluid parts.

Upon this definition Dr. Shaw remarks, that the character holds of foſſils, and of them alone: thus gold, ſilver, and the other metals, antimony, ſalts, ſulphurs, ſtones, and other minerals, really grow fixed to the earth; and if they be divided into the minuteſt parts, they will every where appear of the ſame ſimilar ſolid matter, without any ſhew of veſſels or juices.

MINERAL *Waters*, in medicine, all thoſe wherein any medicinal virtues, beſides thoſe of common water, are found.

Theſe mineral waters are of various kinds, but they are conſidered under the general titles of chalybeate, purgative, and alterative. The more uſeful and commodious additions for examining theſe three kinds of mineral waters, are, according to Dr. Shaw, galls, ſyrup of violets, and oil of tartar per deliquium. Galls diſcover in them any ſmall proportion of vitriol or diſſolved iron, as having the property of immediately ſtriking a purple or black colour in all waters where any ſuch ſubſtance is lodged. Spirit of violet, in the ſame manner, diſcovers any ſmall predominancy of an acid or alkali therein, by changing the water red if acid, and green if alkali preſides. Oil of tartar diſcovers any ſmall proportion of earthy matter leſs capable of diſſolving in water than that ſalt, by precipitating ſuch earthy matter in form of a white cloud to the bottom of the containing glaſs, where it collects and appears like a ſubtile white powder. Theſe particulars may be ſhewn and proved ſatisfactorily by adding to pure water a little of a known acid, alkali, diſſolved iron, and ſubtile earth, or fine light ſediment of an earthy water; applying the ſyrup of violets, galls, and oil of tartar reſpectively.

Mineral waters are imitable by art. The rule is, by a proper analyſis to find the contents of ſuch water (by evaporation, the addition of tinging ingredients, *&c.* as above mentioned) and their proportions; then, by means of ſynthetical chemiſtry, to compoſe a ſimilar mixture: thus, for example, we learn, by a proper analyſis, that the ingredients, or different conſtituent parts of pyrmont-water, are a ſubtile aqueous fluid, a volatile iron, and a predominating alkali, all joined together in one briſk pungent ſpirituous water. The imitation of this kind of chalybeate water, is by much the moſt difficult, and may perhaps be rendered moſt perfect, by boiling the pureſt common water in a cloſe veſſel, with a ſmall proportion of ochre, ſoft iron ore, or pyrites. See the articles PYRMONT and CHALYBEAT.

The imitation of the common purgative mineral waters is eaſy: thus Epſom-water is imitated by barely diſſolving three or four drams of Epſom-ſalt in a quart of pure water, made ſomewhat briſk or quick with a few drops of ſpirit of vitriol and oil of tartar per deliquium, ſo as to let the alkali prevail. See the articles EPSOM and PURGATIVE.

The imitation of the alterative waters, ſuch as thoſe of Bath, Buxton, *&c.* has hither-

hitherto ſcarce been attempted, nor can be rationally, for want of their reſpective juſt analyſis, upon which ſuch imitations ſhould always be grounded. See the articles BATH, BUXTON, &c.

As to the uſe of mineral waters, the learned Heiſter obſerves, that in general they are found to agree much better with perſons in the middle ſtages of life, than with perſons very old or very young. If any general rule can be given in this caſe, it is, that people ſhould not take them when younger than eighteen, or older than ſixty.

As to the method of taking them, people who are of a plethoric habit ought to be blooded before they begin to take them, but all perſons ought to take a gentle purge before they begin them, in order to clear the primæ viæ; and to this purpoſe, nothing is more proper than the common ſalts of Epſom or Glauber's. If there be indications for vomiting in the patient, ſuch as pains, and a ſenſation of weight, in the ſtomach, with bitterneſs in the mouth, then it is extremely proper to give, a day or two before the beginning of the courſes of the waters, a gentle doſe of ipecacuanha. The moſt proper time for drinking them, is early in the morning; ſix or ſeven o'clock is very proper. The moſt proper ſeaſon is the ſummer, in the months of June, July and Auguſt; but in urgent occaſions, the courſe of them may be begun in May and continued till September. It is always proper to begin the uſe of them by ſmall quantities, and gradually increaſe them to larger; the firſt day it may be proper to drink about a pint and a half, the ſecond a quart may be drank, and on the third or fourth three pints. After this the quantity may be increaſed to two quarts a day; and more than this it is not proper to take, unleſs the perſon be of a very robuſt habit: the quantity that is taken as the moſt may be continued every day till the courſe is finiſhed, if the nature of the diſeaſe require it. In general, the mineral waters operate both by ſtool and urine, but in ſome they operate by ſtool ſingly, in others by urine.

MINERVALIA, in roman antiquity, feſtivals celebrated in honour of Minerva, in the month of March; at which time the ſcholars had a vacation, and uſually made a preſent to their maſters, called from this feſtival minerval.

Theſe feſtivals were otherwiſe called quinquatria, from their laſting five days. See the article QUINQUATRIA.

MINHO, a great river of Spain, which, taking its riſe in Gallicia, divides that province from Portugal, and falls into the Atlantic at Caminha.

MINIATO, a town of Italy, fifteen miles weſt of Florence.

MINIATURE, a delicate kind of painting, diſtinguiſhed from all others by the ſmalneſs of the figures, its being performed with dots or points, inſtead of lines; by the faintneſs of the colouring; its requiring to be viewed very near; and by its being uſually done on vellum. See PAINTING and REDUCTION.

This is the niceſt and moſt tedious of all kinds of painting, being performed wholly with the point of the pencil: for when the colours are laid on flat without dotting, though the figures be ſmall, and the ground either vellum or paper, it is not called painting in miniature, but waſhing. There are ſome painters who never uſe any white colour in painting in miniature, but make the ground of the vellum ſerve to raiſe their figures; in which caſe the lights appear bright in proportion to the depth and ſtrength of the colours of the figures. Others, before they go to work, give the vellum a light waſh with white-lead well prepared and purified. Thoſe colours that have the leaſt body, are the beſt and moſt commodious for painting in miniature; as carmine, ultramarine, fine lakes, and greens made of herbs and flowers; but beſides theſe, the following colours are alſo made uſe of, *viz.* vermillion, black-lead, brown-red, maſticote-pale, yellow-maſticote, indigo, ivory-black, lamp-black, ſpaniſh-brown, umber, gall-ſtone, brown-ochre, french-pink, orpiment, gamboge, naples yellow, bladder-green, verditer, ſea-green, german-aſhes, flake-white, and white-lead. All terrene colours, and other groſs ſubſtances, are too coarſe for fine work, how well ſoever they may be ground; but the fineſt particles may be ſeparated by tempering the colour in a cup of fair water, and having ſtirred it well with your finger, and the whole being thoroughly mixed, let it ſubſide for a while, and then pour it by inclination into a ſhell that has been well ſcowred in hot water, and let it ſtand to dry. Yellow-ochre, brown-red, umber, and ultramarine purify by fire; but if they are burnt in too fierce a fire they change,

change, and the brown-red turns yellow; the yellow ochre and umber turn reddiſh, and ſo of the reſt: if the fire is not too fierce it renders them ſofter and kinder than before, ſo that the fineſt and pureſt ultramarine, burnt in a red-hot ſhovel, becomes much more brilliant than it was before it was burnt. Greens, blacks, greys and yellows, on being mixed with a little of the gall of the ox, carp, or eel, eſpecially of the laſt, acquire a luſtre and vivacity not natural to them. You muſt take the galls of eels and hang them on a nail to dry; and when you uſe any, ſteep it in brandy, and mingle ſome of it with the colour already tempered with gum-water in which there is a little ſugar-candy. When you begin to paint, the colours muſt be placed on a ſmall ivory-pallet of the ſize of your hand, in the middle of which ſhould be placed the white, well ſpread out, and near it the lighter, and further off thoſe darker colours you are going to uſe.

Your vellum muſt be glued to a copper-plate, or a piece of thin board, exactly of the ſame ſize with the intended piece; in doing which, the fair ſide of the vellum ſhould be moiſtened with a fine wet linen; and a piece of white paper being put upon the back of it, it is to be applied to the plate or board, and ſtretching it upon it equally in all directions, the vellum, which ought to be every way a finger's breadth larger than what you glue it to, in order to be doubled over and glued behind. When your piece is ſketched out upon the vellum, with a pencil, you muſt, with a little thin carmine, run over all the ſtrokes that they may not be defaced in working, and this done clean your vellum with crumb of bread. In laying on the colours, begin with ſketching or drawing with large, bold, but clear ſtrokes, like thoſe who paint in oil: your lights muſt at firſt be ſomething brighter, and your ſhades not quite ſo dark as is required in finiſhing; becauſe in ſtrippling upon them you ſtrengthen the colour, which if too deep at firſt, would in finiſhing become too dark. Endeavour alſo to drown your colours into each other, that no line of ſeparation may be ſeen between them; to this purpoſe ſoften your ſtrokes with the colours on each ſide of them, ſo that they may be blended and confounded with each other. There are ſeveral ways of ſtrippling, and every painter has his manner; ſome do it with round points, others make them longiſh; others again hatch fine ſtrokes, croſſing each other in all directions, till the whole appears as if ſtrippled or wrought with points; this laſt method is the beſt, boldeſt, and ſooneſt perfected: the artiſt ſhould here accuſtom himſelf to be rich, mellow, and ſoft in his work; the points muſt ſeem in a manner loſt in the ground they are wrought upon, and appear but juſt enough to ſhew that the piece is ſtrippled. When the work ſeems finiſhed, heightening it a little has a fine effect; that is, ſtrengthening the lights with touches of a paler colour than at firſt, which muſt be ſoftened away into the reſt.

For laces, point, and the like, lay on firſt a mixture of blue, black, and white, as for linens, and then heighten the pattern, flowers or flouriſhes, with white only; than ſhade and finiſh with the firſt colour. When they are upon fleſh, or any thing elſe which you would have ſeen through them, finiſh what is under them, as if you intended to lay nothing upon it, and then lay on the lace or point with pure white, and finiſh with the other mixture. In painting a fur, lay on a ground as for drapery, according to the colours of it, and then ſhade by the ſame rule; and having done, inſtead of ſtrippling, draw fine ſtrokes this way and that, according as the down of the fur you imitate lies: heighten the lights of of a brown fur with ochre and white, and thoſe of a light fur with white and a little blue.

There are ſeveral ſorts of grounds for pictures and portraits; ſome are quite brown, with ſpaniſh-brown, umber, *&c.* with a little black and white; others are more yellow, being mixed with a good deal of ochre; others are upon the grey, with indigo; and others are blue or crimſon. See the article GROUND.

To make a ground all of glory, firſt lay a bright mixture of a little ochre and white, adding more and more of the firſt as you draw more and more towards the extremities of the intended picture; and when the ochre happens not to be dark enough (for you muſt go on darkening and darkening) add gall-ſtone, then carmine, and at laſt ſpaniſh-brown. This ground you muſt lay in ſuch a manner, that the different degrees of darkneſs may, as much as poſſible, inſenſibly increaſe and ſtrengthen: the whole muſt then be ſtrippled with the ſame colours.

For a day-ſky, mingle ſome ultramarine

with a good deal of white, and lay it on as ſmooth and uniform as poſſible with a large pencil and broad ſtrokes, laying it on paler and paler as you deſcend towards the horizon, which muſt be made of vermillion, mine-de-plumb and white, of the ſtrength that finiſhes the ſky, or rather a little weaker, artfully blending the blue and red, mingling at laſt gall-ſtone and a good deal of white; and all this muſt be ſo laid on that no ſeparation muſt be ſeen between the colours. When there are to be clouds in the ſky, you need lay on no blue where they are to be, but ſketch them out, if they are reddiſh, with vermillion, gall-ſtone, and white, together with a little indigo; and if they are to be darker, a great deal muſt be uſed of this laſt, making the lights of the one and the other with maſticot, vermillion and white, according to the degree of ſtrength you would give them, ſwelling out the whole with ſtrippling; and if the ſky be not ſufficiently uniform, you muſt ſtripple that likewiſe.

MINIM, in muſic, a note equal to two crotchets, or half a ſemibreve. See the articles NOTE, CROTCHET, *&c.*

MINIMS, a religious order in the church of Rome, founded by St. Francis De Paula, towards the end of the fifteenth century. Their habit is a coarſe black woollen ſtuff, with a woollen girdle, of the ſame colours, tied in five knots. They are not permitted to quit their habit and girdle night nor day. Formerly they went bare-footed, but are now allowed the uſe of ſhoes.

MINIMUM, in the higher geometry, the leaſt quantity attainable in a given caſe. See the article MAXIMUM.

MINION, a piece of cannon, at preſent but little uſed in the field. For its length, bore, and the weight of the ball it carries, ſee CANNON.

MINISTER, a perſon who preaches, performs religious worſhip in public, adminiſters the ſacraments, *&c.* See the articles BISHOP, DEACON, *&c.*

MINISTER *of ſtate*, a perſon to whom a ſovereign prince intruſts the adminiſtration of the government.

Foreign MINISTER, is a perſon ſent into a foreign country to manage the affairs of his province, or of the ſtate to which he belongs. Of theſe there are two kinds; thoſe of the firſt rank are embaſſadors and envoys extraordinary, who repreſent the perſons of their ſovereigns. The miniſters of the ſecond rank are the ordinary reſidents. See EMBASSADOR, *&c.*

MINIUM, or RED-LEAD, a preparation of lead uſed both in pharmacy and painting. It is made in the following manner: melt lead in a broad earthen veſſel unglazed, and ſtir it continually with a ſpatula till it be calcined into a grey powder; this is called the calx of lead: continue the fire, ſtirring it in the ſame manner, and it becomes yellow; in this ſtate it is called maſticot: after this put it into a reverberatory furnace and it will calcine farther, and become of a fine red, which is the common minium or red-lead. Minium is uſed externally on many occaſions. It obtunds the acrimony of the humours, allays inflammations, and is excellent in cleanſing and healing old ulcers; and on theſe occaſions, it is uſed in many of the plaſters and ointments of the ſhops.

In painting, red-lead is as heavy and ſtrong a colour as moſt we have; but when prepared, is the moſt delightful one. Mr. Boyle directs the preparing it as follows: put four ounces of it in a quart of rain-water; then ſtir it, and pour off the water immediately, and let it ſettle to the bottom of every cup or glaſs you pour it into; then pour off the water, and in a day's time you will have the colour dry, and as fine as you can deſire. Some ſhade red-lead with carmine, which has a fine effect, and renders it equal to the brighteſt red flower: when the carmine has ſhaded the red-lead, it may be ſhaded again with lake in the ſtrongeſt part.

MINOR, in law, is an heir, either male or female, before they arrive at the age of twenty-one; during the minority of ſuch, they are uſually incapable of acting for themſelves. See INFANT.

MINOR, in logic, the ſecond propoſition of a regular ſyllogiſm. See SYLLOGISM.

MINOR, in muſic, ſignifies leſs, and is applied to certain concords or intervals which differ from others of the ſame denomination by half a tone: thus we ſay a third minor, meaning a leſs third; a ſixth major and minor. See the articles SIXTH and THIRD.

Concords that admit of a major and minor, are called imperfect. See the article CONCORD.

MINORCA, an iſland in the Mediterranean, about twenty miles eaſt of Majorca, thirty miles long, and twelve broad.

broad. It is ſubject to Great Britain, and only valued for its capacious harbour of Port Mahon.

MINORS, or FRIARS-MINOR, the ſame with franciſcans. See FRANCISCAN.

MINOTAUR, *minotaurus*, in antiquity, a fabulous monſter much talked of by the poets, feigned to be half man and half bull.

The minotaur was brought forth by Paſiphae, wife of Minos, king of Crete. It was ſhut up in the labyrinth of that iſland, and at laſt killed by Theſeus.

Servius gives the explanation of this fable: he ſays that a ſecretary of king Minos, named Taurus, bull, having an intrigue with the queen Paſiphae, in the chamber of Dædalus, ſhe was at length delivered of twins; one of whom reſembled Minos, and the other Taurus. This occaſioned the production to be reputed monſtrous.

MINOVERY, a treſpaſs committed in the foreſt, by ſomething that is a man's handy work, as an engine to catch deer, &c. See the article FOREST.

MINOW, in ichthyology, a ſmall ſpecies of cyprinus, too well known to need a particular deſcription. See CYPRINUS.

MINSTER, antiently ſignified the church of a monaſtery or convent.

MINSTREL, an antient term for a fidler, or player on any other kind of muſical inſtrument.

MINT, the place in which the king's money is coined. See COINAGE.

There were antiently mints in almoſt every county in England; but the only mint at preſent in the britiſh dominions, is that in the Tower of London. The officers of the mint are, 1. The warden of the mint, who is chief; he overſees the other officers, and receives the bullion. 2. The maſter worker; who receives the bullion from the warden, cauſes it to be melted, delivers it to the moneyers, and when it is coined receives it again. 3. The comptroller, who is the overſeer of all the inferior officers, and ſees that all the money is made to the juſt aſſize. 4. The aſſay-maſter; who weighs the gold and ſilver, and ſees that it is according to the ſtandard. 5. The auditor; who takes the accounts. 6. The ſurveyor of the melting; who after the aſſay-maſter has made trial of the bullion, ſees that it is caſt out, and not altered after it is delivered to the melter. 7. The engraver; who engraves the ſtamps and dyes for the coinage of the money. 8. The clerk of the irons; who ſees that the irons are clean and fit to work with. 9. The melter; who melts the bullion before it is coined. 10. The provoſt of the mint; who provides for, and overſees all the moneyers. 11. The blanchers; who anneal and cleanſe the money. 12. The moneyers; ſome of whom forge the money, ſome ſhear it, ſome round and mill it, and ſome ſtamp or coin it. 13. The porters; who keep the gate of the mint.

MINT, *mentha*, in botany, a genus of the didynamia angioſpermia claſs of plants, the flower of which is monopetalous, and divided into four ſegments at the limb: there is no pericarpium, the ſeeds being contained in the bottom of the cup.

Under this genus are comprehended the mentha, menthaſtrum, and pulegium, or penny-royal of authors; all which are eſteemed aperient and cephalic. Pepper-mint is highly extolled as a ſtomachic and carminative: as is alſo ſpear-mint. The diſtilled water of this plant is given in flatulencies, and colics ariſing from that kind of cauſe.

MINUARTIA, in botany, a genus of the triandria trigynia claſs of plants, the calyx of which is a long, erect, five leafed perianthium. It has no corolla; the fruit is an oblong triangular capſule, compoſed of three valves, and containing one cell, in which are a few roundiſh, compreſſed ſeeds.

MINUET, in muſic, a very graceful kind of dance, which conſiſts of a coupee, a high ſtep, and a balance; it begins with a beat, and its motion is triple.

It has commonly two ſtrains, each played twice over; the firſt has four or eight bars, the laſt of which ſhould be either the dominant or mediant of the mode, but never the final: the ſecond has eight bars, and uſually ends on the final of the mode, with a pointed minim, or whole bar.

MINUSCULÆ, the ſmall letters, in contradiſtinction to the majuſculæ or capitals.

MINUTE, in geometry, the ſixtieth part of a degree of a circle. See the articles CIRCLE and DEGREE.

Minutes are denoted by one acute accent, thus (′); as the ſecond, or ſixtieth part of a minute, is by two ſuch accents, thus (″); and the third by three (‴), &c.

MINUTE *of time*, the ſixtieth part of an hour. See the article HOUR.

MINUTE,

MINUTE, in architecture, uſually denotes the ſixtieth, ſometimes the thirtieth part of a module. See the article MODULE.

MINUTE is alſo uſed for a ſhort memoir, or ſketch of a thing, taken in writing.

MIRABILIS, MARVEL OF PERU, in botany, a genus of the pentandria monogynia claſs of plants, with a monopetalous funnel-faſhioned flower; its fruit is an ovato-pentagonal nut, containing a ſingle globoſe ſeed.

Tournefort and Linnæus will have the root of this plant to be the jalap of the ſhops; but Houſton declares, that jalap is the root of a ſpecies of convolvulus. See the article JALAP.

MIRACLE, is defined by Dr. Samuel Clarke, to be a work effected in a manner different from the common and regular method of providence, by the interpoſition either of God himſelf, or ſome intelligent agent ſuperior to man.

It has been much controverted, whether true miracles can be worked by any leſs power than the immediate power of God; and whether to complete the evidence of a miracle, the nature of the doctrine pretended to be proved by it, is neceſſary to be taken into the conſideration. The above learned author undertakes to ſet this matter in a clear light, as follows.

In reſpect to the power of God, and the nature of the things themſelves, all things that are poſſible at all, are equally eaſy to be done: it is at leaſt as great an act of power to cauſe the ſun to move at all, as to cauſe it at any time to ſtand ſtill; yet this latter we call a miracle, the former not.

What degrees of power God may reaſonably be ſuppoſed to have communicated to created beings, or ſubordinate intelligences, is impoſſible for us to determine: therefore a miracle is not rightly defined to be ſuch an effect as could not have been produced by any leſs power than the divine omnipotence. There is no inſtance of any miracle in Scripture, which to an ordinary ſpectator would neceſſarily imply the immediate operation of original, abſolute, and underived power.

All things that are done in the world, are done either immediately by God himſelf, or by created intelligent beings, matter not being at all capable of any laws, or powers whatſoever; ſo that all thoſe things which we ſay are the effects of the natural powers of matter and laws of motion, are properly the effects of God acting upon matter continually and every moment, either immediately by himſelf, or mediately by ſome created intelligent beings. Conſequently it is no more againſt the courſe of nature for an angel to keep a man from ſinking in the water, than for a man to hold a ſtone from falling in the air, by overpowering the law of gravitation; and yet the one is a miracle, the other not ſo.

The only poſſible ways by which a ſpectator may certainly and infallibly diſtinguiſh whether miracles be the works either immediately of God himſelf, or of ſome good angel employed by him; or whether, on the contrary, they are the works of evil ſpirits, are theſe: if the doctrine atteſted by miracles, be in itſelf impious, or manifeſtly tending to promote vice; then, without all queſtion, the miracles, how great ſoever they may appear to us, are neither worked by God himſelf nor by his commiſſion. If the doctrine itſelf be indifferent, and, at the ſame time, there be worked other miracles, more and greater than the former, then that doctrine which is atteſted by the ſuperior power, muſt neceſſarily be believed to be divine: this was the caſe of Moſes and the egyptian magicians. If, in the laſt place, the doctrine atteſted by miracles tends to promote the honour of God, and the practice of righteouſneſs among men; and yet nevertheleſs be not in itſelf demonſtrable, nor could without a revelation be diſcovered to be actually true; and there is no pretence of more and greater miracles to contradict it; which is the caſe of the doctrine and miracles of Chriſt; then the miracles are unqueſtionably divine, and the doctrine muſt, without all controverſy, be acknowledged as an immediate and infallible revelation from God.

The lord Bacon obſerves, that a miracle was never wrought by God to convert an atheiſt, becauſe the light of nature might have led him to confeſs a God: but miracles, ſays he, are deſigned to convert idolaters, and the ſuperſtitious, who have acknowledged a deity, but erred in the manner of adoring him; becauſe no light of nature extends ſo far as fully to declare the will and true worſhip of God. Acoſta enquiring into the cauſe why miracles are not wrought by the preſent miſſionaries for the converſion of heathen nations, as they were by the chriſtians of the primitive ages, gives this as one reaſon; that the chriſtians at firſt were ignoran:

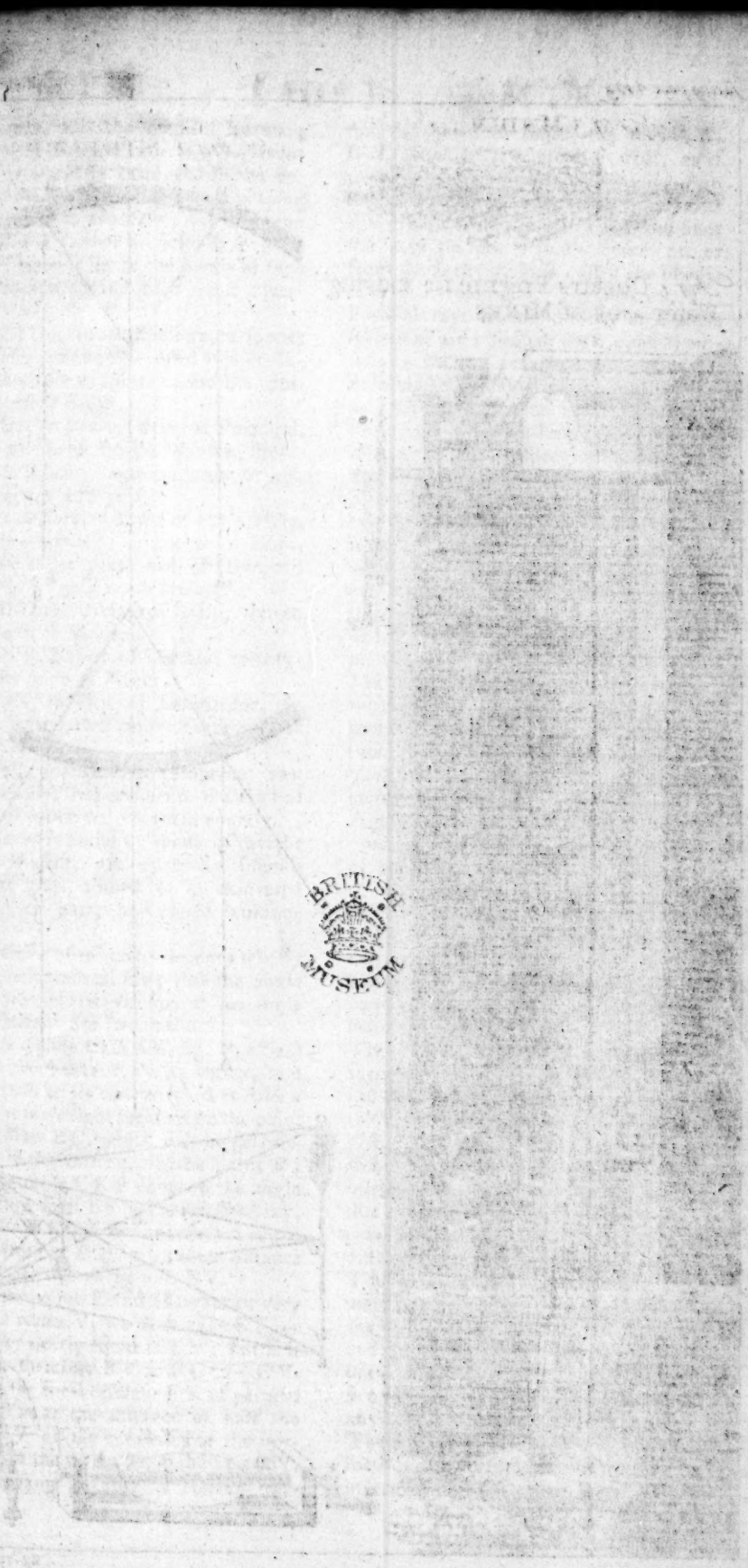
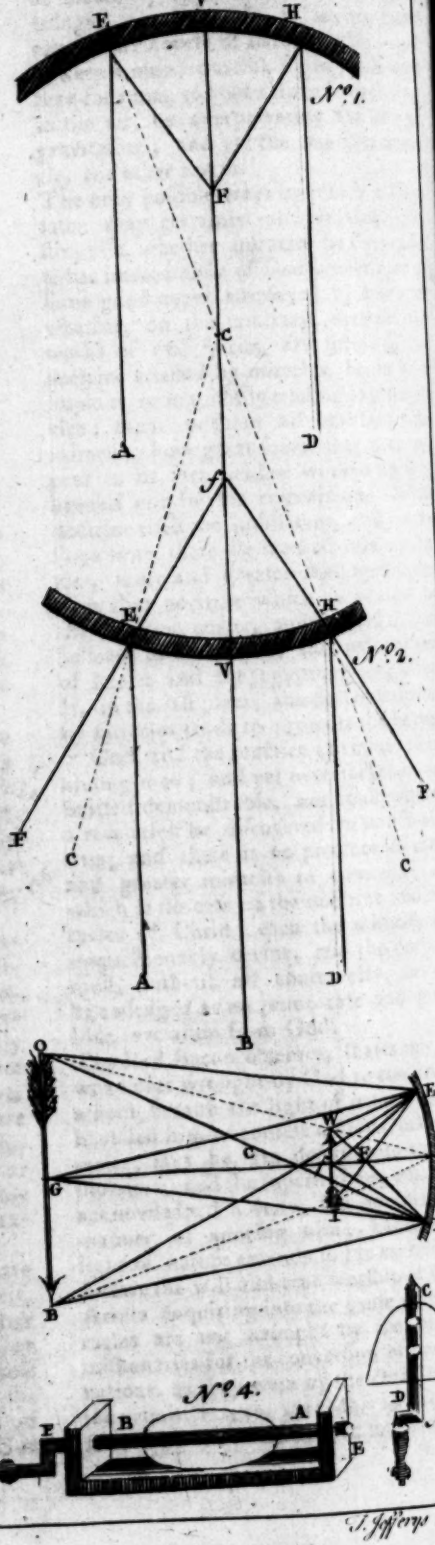

BRITISH MUSEUM

Fig. 3. MINIUM.

Fig. 1. Costar's Engine for raising Water out of MINES

Fig. 2. MIRROURS.



J. Jefferys sculp

norant men, and the gentiles learned; but now, on the contrary, all the learning in the world is employed in the defence of the Goſpel, and there is nothing but ignorance to oppoſe it; and there can be no need of farther miracles in ſo good a cauſe, when it is in the hands of ſuch able advocates againſt ſuch weak adverſaries.

MIRALETUS, in ichthyology, a ſpecies of ray fiſh, commonly called raja oculata, with a row of ſpines round the eyes. See the article RAJA.

MIRANDA *de Douro*, a city of Portugal, in the province of Tralos Montes, ſituated on the Douro: weſt longitude 6° 45′, north latitude 41° 30′.

MIRANDA *de Ebro*, a town of old Caſtile, in Spain: ſituated on the river Ebro, forty-two miles north-eaſt of Burgos: weſt long. 3° 30′, north lat. 43°.

MIRANDOLA, a city of Italy, ſixteen miles north of Modena.

MIRECOUR, a town of Lorrain, twenty-two miles ſouth of Nancy.

MIREPOIX, a city of Languedoc, in France, thirty-two miles ſouth-eaſt of Toulouſe.

MIRROUR, *ſpeculum*, in catoptrics, any poliſhed body, impervious to the rays of light, and which reflects them equally.

Mirrours were antiently made of metal; but, at preſent, are generally ſmooth plates of glaſs, tinned or quickſilvered on the back part, and called looking-glaſſes.

The doctrine of mirrours depends wholly on that fundamental law, that the angle of reflection is always equal to the angle of incidence. See INCIDENCE.

Let E H (plate CLXXX. fig. 2, n° 7.) be a concave mirrour, V its vertex, and C the center of its concavity. Let A be a ray of the ſun's light incident on the point E, and draw E C, which will be perpendicular to the mirrour in the point E; make the angle C E F equal to the angle AEC, then ſhall EF be the reflected ray. Thus alſo HF will be the reflected ray of the incident one D H, at an equal diſtance on the other ſide of the axis B V.

If now the points E and H be taken very near the vertex V, we ſhall have E F, or HF, very nearly equal to F V; but E F = F C; therefore F V = F C = ½ C V. That is, the focal diſtance F V of parallel rays will be at the diſtance of half the radius C V of the concavity of the mirrour, from the vertex V, in the axis B V.

After the ſame manner, a convex mirrour is ſhewn to reflect the rays A E, D H, (*ibid.* n° 2.) into E F, H F, as if they came diverging from a point *f* in the axis C V, which is half the radius C V diſtant from the vertex V. But ſince the rays do not actually come at, or from the focus *f*, it is called the imaginary or virtual focus. See FOCUS.

Parallel rays falling directly on a plane ſpeculum are reflected back upon themſelves; if they fall obliquely, they are reflected in the ſame angle, and parallel as they fell. Hence there is no ſuch thing, properly ſpeaking, as a focus belonging to a plane ſpeculum, neither real nor virtual.

The focus F, or *f*, of parallel rays, is called the ſolar focus; becauſe in that the image of the ſun is formed, and of all objects very remote. But the focus of any object ſituated near the mirrour will have its diſtance from the vertex more or leſs than half the radius; the rule in all caſes being as follows:

Multiply the diſtance of the object into the radius of the mirrour, and divide the product by the ſum of the radius and twice the diſtance of the object; the quotient will be the focal diſtance of a convex mirrour.

Again for a concave mirrour, the ſame product of the radius into the diſtance of the object, divided by the difference of radius and twice the diſtance of the object, will give the focal diſtance V F or V *f*. And here we are to obſerve, that, as twice the diſtance of the object is leſſer or greater than the radius, ſo the focus will be poſitive or negative, that is, behind the glaſs or before it.

The image of the object is formed in the focus proper to its diſtance: and, ſince the writers on optics demonſtrate that the angles under which the object O B (*ibid.* n° 3.) and its image I W are ſeen from the center or vertex of the mirrour C are always equal, it follows, that the image I W will be always in proportion to the object O B, as the focal diſtance V F to the object's diſtance G V.

The poſition of the object will be always erect at a poſitive focus, or behind the ſpeculum; diminiſhed by a convex, and magnified by a concave one. Hence, ſince a convex has but one, *viz.* an affirmative focus; ſo it can never magnify any object, howſoever poſited before it.

The poſition of the image in a negative focus, or that before the glaſs, will be ever inverted; and, if nearer the vertex than the

the center C, it will be leſs; if farther from it, it will be greater than the object; but in the center it will be equal to the object, and ſeem to touch it.

The image formed by a plane ſpeculum is erect; large as the life; at the ſame apparent diſtance behind the glaſs as the object is before it; and on the ſame ſide of the glaſs with the object. Thoſe properties render this ſort of mirrour of moſt common uſe, *viz.* as a looking-glaſs.

If the rays fall directly, or nearly ſo, on a plane mirrour, and the object be opake, there will be but one ſingle image formed, or at leaſt be viſible; and that by the ſecond ſurface of the ſpeculum, and not by the firſt, through which the rays do moſt of them paſs.

But if the object be luminous, and the rays fall very obliquely on the ſpeculum, there will be more than one image formed, to an eye placed in a proper poſition to view them. The firſt image being formed by the firſt ſurface will not be ſo bright as the ſecond, which is formed by the ſecond ſurface. The third, fourth, &c. images are produced by ſeveral reflections of the rays between the two ſurfaces of the ſpeculum; and, ſince ſome light is loſt by each reflection, the images from the ſecond will appear ſtill more faint and obſcure, to the eighth, ninth, or tenth, which can ſcarcely be diſcerned at all.

Mirrours may be divided into plane, concave, convex, cylindrical, conical, parabolical, and elliptical.

The beſt manner of preparing convex mirrours hither to known is given us by Wolfius, thus:

Melt one part of tin, another of marcaſite, together, and to this maſs add two parts of mercury; as ſoon as the mercury begins to evaporate into ſmoke, the whole is to be thrown into cold water, and, when well cooled, the water decanted off. Strain the mixture through two or three folds of linen cloth; and what is thus ſecreted pour into the cavity of a glaſs-ſphere, which is to be turned gently round its axis till the whole ſurface be covered; the reſt being reſerved for future uſe. If the ſphere were of coloured glaſs, the mirrour will be ſo too. And in like manner may conic, elliptic, cylindric, and other mirrours be made. See the article FOLIATING.

For elliptical, parabolical, and hyperbolical mirrours, the mould is to be thus prepared; on a wooden or braſs plane deſcribe an ellipſis AB (*ibid.* n° 4.) alſo a parabola or hyperbola, CD (*ibid.* n° 5.) then cut out the figure from the plane with all the accuracy imaginable.

To the elliptic figure fit an axis, as EF, with two fulcra to ſuſtain it, &c. and a handle to move it. Lay a quantity of the clay under it, and turn about the axis by the handle, till the plane AB have impreſſed the elliptical figure exactly thereon.

The axis of the parabolical or hyperbolical figure CD is to be fixed at the vertex ſo as to be always erect. This is to be turned about, till it have given its figure to the clay round it.

The part of the mould thus formed is to be dried, and then ſmeared over with fat, &c. then a convex mould is to be made by putting a quantity of the ſame clay into the cavity thus formed. The latter is called the male, as the former is the female mould. The male mould, when dry, is to be applied within the female, ſo as to leave the intended thickneſs of the mirrour between them. Theſe mirrours are very difficult to be made, as the figure thereof is apt to be damaged in the grinding. See the article GRINDING.

The properties of cylindrical mirrours are. 1. The dimenſions of objects correſponding lengthwiſe to the mirrour are not much changed; but thoſe correſponding breadthwiſe have their figures altered and their dimenſions leſſened the farther from the mirrour; whence ariſes a very great diſtortion. 2. If the plane of the reflection cut the cylindric mirrour thro' the axis, the reflection is performed in the ſame manner as in a plane mirrour; and if parallel to the baſe, the reflection is the ſame as in a ſpherical mirrour; if it cut it obliquely, the reflection is the ſame as in an elliptic mirrour. Hence, as the plane of reflection never paſſes thro' the axis of the mirrour, except when the eye and objective line are in the ſame plane; nor parallel to the baſe, except when the radiant point and the eye are at the ſame height; the reflection is therefore uſually the ſame as in an elliptic one. 3. If a hollow cylindric mirrour be directly oppoſed to the ſun, inſtead of a focus of a point, the rays will be reflected into a lucid line parallel to its axis, at a diſtance ſomewhat leſs than a fourth of its diameter. Hence ariſes a method of drawing anamorphoſes,

morphoſes, that is, wild deformed figures on a plane, which appear well proportioned, when viewed in a cylindric mirrour.

In an elliptic mirrour, if a ray ſtrike on it from one of its focuſes, it is reflected into the other.

In parabolic mirrours, as all the rays they reflect meet in one point, they make the beſt burning-glaſſes.

MIS, a negative particle prefixed to words, particularly law-terms, generally ſignifying a fault or defect; as miſpriſion, miſnomer, *&c.* See MISPRISION, *&c.*

MISADVENTURE, in law, is by ſome taken to ſignify the killing a perſon partly by negligence, and partly by chance, as where a perſon is killed by a ſtone thrown at random: other lawyers define it, a perſon's coming to his death by ſome accidental outward violence, as by a ſtroke of a horſe, the fall of a tree, or the like.

MISCHNAH, or MISNAH, the code or collection of the civil law of the Jews. The Jews pretend, that when God gave the written law to Moſes, he gave him alſo another not written, which was preſerved by tradition among the doctors of the ſynagogue, till rabbi Judah, ſurnamed the Holy, ſeeing the danger they were in, through their diſperſion, of departing from the traditions of their fathers, judged it proper to reduce them to writing.

The miſnah is divided into ſix parts: the firſt relates to the diſtinction of ſeeds in a field, to trees, fruits, tythes, *&c.* The ſecond regulates the manner of obſerving feſtivals: the third treats of women, and matrimonial caſes: the fourth of loſſes in trade, *&c.* the fifth is on obligations, ſacrifices, *&c.* and the ſixth treats of the ſeveral ſorts of purification. See the article TALMUD.

MISCONTINUANCE, in law, the ſame with diſcontinuance. See the article DISCONTINUANCE.

MISDEMEANOUR, in law, ſignifies a heinous offence or fault, particularly in the execution of an office.

MISE, in law-books, is uſed in various ſenſes: thus it ſometimes ſignifies coſts or expences, in which ſenſe it is commonly uſed in entering of judgments in actions perſonal. It is alſo uſed for the iſſue to be tried on the grand aſſize, in which caſe, joining of the miſe upon the meer right, is putting in iſſue between the tenant and demandant, who has the beſt or cleareſt right.

Miſe alſo ſignifies a tribute, or cuſtomary preſent formerly paid in the county palatine of Cheſter, on the change of every owner of that earldom, for the enjoyment of their liberties.

MISEN, or MIZEN, in a ſhip. See the article MIZEN.

MISERERE MEI, in medicine, a name by which ſome call the iliac paſſion. See the article ILIAC.

MISERICORDIA, in law, is an arbitrary fine impoſed on any perſon for an offence: this is called miſericordia, becauſe the amercement ought to be but ſmall, and leſs than that required by magna charta. If a perſon be outrageouſly amerced, in a court that is not of record, the writ called moderata miſericordia lies for moderating the amercement according to the nature of the fault.

MISITHRA, or LACEDÆMON. See the article LACEDÆMON.

MISFEASANCE, in law-books, ſignifies a treſpaſs. See the article TRESPASS.

MISLETOE, *viſcum*, in botany. See the article VISCUM.

MISNAH, or MISCHNAH. See the article MISCHNAH.

MISNIA, or MEISSEN. See MEISSEN.

MISNOMER, in law, a miſnaming, or miſtaking a perſon's name. The chriſtian name of a perſon ſhould always be perfect, but the law is not ſo ſtrict and preciſe in regard to ſurnames, a ſmall miſtake in which will be diſpenſed with to make good a contract, and ſupport the act of the party.

MISPRISION, ſignifies, in general, ſome neglect or over ſight; as where a perſon is privy to a treaſon or felony committed by another, and neglects to reveal it to the king or his council, or to a magiſtrate; but entirely conceals it: this is called miſpriſion of thoſe crimes. In caſes of miſpriſion of treaſon, the offender is to be impriſoned for life, and to forfeit his goods and chattels, together with the profits of his lands, *&c.* but in miſpriſion of felony, the offender is only to be puniſhed with fine and impriſonment, and to remain in priſon till the fine is paid.

The word miſpriſion, is taken for many great offences which are not treaſon or felony, but nearly allied to them; and all great miſdemeanors that have no certain name appointed by the law, have ſometimes been called miſpriſion. There is alſo miſpriſion at large, where a per-

ſon contemns the king's prerogative by refuſing to aſſiſt him, by writing or ſpeaking againſt his perſon or government, refuſing to take the oaths of allegiance and ſupremacy, &c.

MISSA, the maſs. See MASS.

MISSAL, the romiſh maſs-book, containing the ſeveral maſſes to be ſaid on particular days. See the article MASS.

MISSEL-BIRD, the engliſh name of the greyiſh-yellow turdus, with a ſpotted breaſt. See the article TURDUS.

It is the largeſt bird of the turdus-kind, known among authors by the name of turdus viſcivorus major.

MISSEN, or MIZEN, in a ſhip. See the article MIZEN.

MISSIONARIES, ſuch eccleſiaſtics as are ſent by any chriſtian church, into pagan or infidel countries, to convert the natives, and eſtabliſh the chriſtian religion among them.

There are in France, and other popiſh countries, ſeveral congregations of miſſionaries, whoſe principal end is to be employed on miſſions, and to inſpire into the young clerks that ſpirit of piety and devotion which is neceſſary for the worthy diſcharge of their miniſtry. Such are the congregations of the prieſts of the miſſion, the eudiſts, the miſſionaries of Lyons, and ſome others. The moſt remarkable of theſe congregations is that of the prieſts of the miſſion, which conſiſts of ſecular clergy; who nevertheleſs make four ſimple vows, of poverty, chaſtity, obedience, and perſeverance. Their habit is diſtinguiſhed from that of other eccleſiaſtics only by a linen collar four fingers broad, and by their wearing a little tuft of beard.

MISSIVE, ſomething ſent to another, as miſſive letters; meaning letters ſent from one to another upon buſineſs, in contradiſtinction to letters of gallantry, points of learning, diſpatches, &c.

MIST, the ſame with fog. See FOG.

MISUSER, in law, ſignifies ſome abuſe of any particular liberty or benefit. The charter of a corporation, as well as an office, may be forfeited by miſuſer.

MISY, in natural hiſtory, a ſpecies of the chalcantha, a foſſil very common in the turkiſh dominions, and ſometimes found in the mines at Cremnitz in Hungary. See the article CHALCANTHA.

It is a conſiderably firm ſubſtance, of an irregular texture, not compact, much reſembling ſome of our more gaudy marchaſites, but wanting in their hardneſs and weight. It is of no determinate ſhape or ſize, but is oftentimes found in ſmall detached maſſes, which are uſually broad, flat, and very rugged at the edges. As to its medical virtues, they are no other than thoſe of the green vitriol. See the article VITRIOL.

MITCHELLA, in botany, a genus of the tetrandria monogynia claſs of plants, the calyx of which conſiſts of two flowers, placed upon the germen, the corolla is monopetalous, and funnel-ſhaped; the fruit is a bipartite, globoſe berry; the ſeeds are compreſſed, and callous.

MITE, a ſmall coin formerly current, equal to about one third part of a farthing.

It alſo denotes a ſmall weight uſed by the moneyers. It is equal to the twentieth part of a grain, and is divided into twenty-four doits.

MITE, in zoology. See ACARUS.

MITELLA, in botany, a genus of the decandria digynia claſs of plants, the corolla whereof conſiſts of five patent petals, of an oblong figure, longer than the ſegments of the cup, with their ungues narrow, and inſerted into the calyx: the fruit is a capſule of a globoſe figure, but with a point formed of two valves, and opening between, containing only one cell: the ſeeds are numerous, and of a roundiſh oblong figure.

MITHRIDATE, in pharmacy, a compound medicine in form of an electuary, ſerving either as a remedy or preſervative againſt poiſons; being alſo accounted a cordial, opiate, ſudorific, and alexipharmic.

Mithridate is one of the capital medicines in the apothecaries ſhops; the preparation of it, according to the direction of the college, is as follows: take of cinnamon, fourteen drams; of myrrh, eleven drams; agaric, ſpikenard, ginger, ſaffron, ſeeds of treacle-muſtard, frankincenſe, chio-turpentine, of each ten drams; camels-hay, coſtus, indian leaf, french lavender, long pepper, ſeeds of hartwort, juice of the rape of ciſtus, ſtrained ſtorax, opopanax, ſtrained galbanum, balſam of Gilead, or in its ſtead expreſſed oil of nutmegs, ruſſia-caſtor, of each an ounce; poley-mountain, water-germander, the fruit of the balſam-tree, ſeeds of the carrat of Crete, bdellium ſtrained, of each ſeven drams; celtic nard, gentian-root, leaves of dittany of Crete, red roſes, ſeed of macedonian parſley, the leſſer cardamom-ſeeds freed from

from their huſks, ſweet fennel-ſeeds, gum arabic, opium ſtrained, of each five drams; root of the ſweet flag, root of wild valerian, anniſeed, ſagapenum ſtrained, of each three drams; ſpignel, St. John's wort, juice of acacia, the bellies of ſkinks, of each two drams and a half; of clarified honey, thrice the weight of all the reſt; diſſolve the opium firſt in a little wine, and then mix it with the honey made hot. In the mean time melt together in another veſſel the galbanum, ſtorax, turpentine, and the balſam of Gilead, or the expreſſed oil of nutmeg, continually ſtirring them round that they may not burn; and as ſoon as theſe are melted, add to them the hot honey, firſt by ſpoonfuls, and afterwards more freely; laſtly, when this mixture is near cold, add by degrees the reſt of the ſpecies reduced to powder.

MITRALES VALVULÆ, mitral valves, in anatomy, two valves ſituated in the left ventricle of the heart, at the ingreſs of the pulmonary vein, ſerving to hinder the ingreſs and regreſs of the blood from the heart into the veins again, while they are conſtricted. See HEART.

MITRE, a ſacredotal ornament worn on the head by biſhops, and certain abbots on ſolemn occaſions; being a ſort of cap, pointed, and cleft at top. The high-prieſt among the Jews wore a mitre or bonnet on his head. The inferior prieſts among the Jews had likewiſe their mitres, but in what reſpect they differed from that of the high prieſt is uncertain. Some contend that the antient biſhops wore mitres, but this is by no means certain. Thoſe young women among the primitive chriſtians, who profeſſed a ſtate of virginity, and were ſolemnly conſecrated thereto, wore a purple and golden mitre, as a badge of diſtinction. His holineſs the pope has no leſs than four different mitres, which are more or leſs rich, according to the ſolemnities of the feſtivals on which they are worn. The cardinals antiently wore mitres; ſome canons of cathedrals, in popiſh countries, have the privilege of wearing the mitre; and ſome great families in Germany bear it for their creſt.

MITRE-SHELL, the ſmooth and ſlender buccinum, with a ſplit roſtrum. See the article BUCCINUM.

MITREOLA, in botany, a plant of the pentandria-digynia claſs, the flower of which conſiſts of a ſingle campanulated petal, divided into five ſegments at the limb: the fruit is an erect ſimple bilocular capſule, containing numerous ſmall and roundiſh ſeeds.

MITTAU, the capital of the dutchy of Courland, in Poland: ſituated in eaſt long. 24°, north lat. 56° 40'.

MITTENDO MANUSCRIPTUM PEDIS FINIS, in law, an antient judicial writ, directed to the treaſurer and chamberlain of the exchequer, requiring them to ſearch for and tranſmit the foot of a fine, acknowledged before the juſtices in eyre into the common pleas, &c.

MITTIMUS, as generally uſed, hath two ſignifications. 1. It ſignifies a writ for removing and transferring of records from one court to another. 2. It ſignifies a precept, or command in writing under the hand and ſeal of a juſtice of the peace, directed to the gaoler or keeper of ſome priſon, for the receiving and ſafe-keeping of an offender charged with any crime until he be delivered by due courſe of law.

MIXT, or MIXT BODY, in philoſophy and chemiſtry, that which is compounded of different elements or principles; in which ſenſe it ſtands contradiſtinguiſhed from ſimple or elementary, which is applied to bodies conſiſting of one principle only, as the chemiſts take ſulphur, ſalt, &c. to do. The buſineſs of chemiſtry is, to reſolve mixt bodies into their principles, or component parts.

MIXT ACTION, in law, is an action partly real, and partly perſonal, which lies both for the thing detained, and againſt the perſon of the detainer. See ACTION.

MIXTURE, a compound, or aſſemblage of ſeveral different bodies in the ſame maſs. Dr. Shaw obſerves, that the mixtures, reſolutions, and compoſitions made by chemiſtry, are extremely numerous, and may be increaſed ad infinitum. By mixture, ſays he, we produce all the artificial vitriols, ſoaps, glaſſes, &c. and can compound theſe again in an almoſt infinite variety. So that of the reſolutions, mixtures, compoſitions, and recompoſitions in chemiſtry, there ſeems to be no bounds; whence great room is left, for the making of new chemical diſcoveries. Dr. Pemberton juſtly cenſures the irregular and inartificial mixtures uſed in pharmacy, and obſerves, that they were introduced by the ignorance of the firſt ages, and enforced by the perpetual fear and jealouſies of poiſons, againſt which the antients endleſsly buſied themſelves in the ſearch of antidotes, vainly hoping

to frame compoſitions that might ſingly prevail againſt every ſpecies of poiſon; hence they amaſſed together whatever they imagined to be endued with alexipharmic powers. By this procedure the ſimplicity of phyſic was loſt, and a wantonneſs in mixing, enlarging, and accumulating took place, which has continued even to our times. The great Mr. Boyle has largely conſidered this ſubject, and among other arguments, ſays, it is reaſonable to ſuſpect, that where a great many ingredients are blended into a ſingle medicine, one or other of them may have different operations from thoſe deſigned by the phyſician; and, by awakening ſome ſleeping ferment, produce a new diſtemper, or excite and actuate ſome other hoſtile matter, that before lay quiet, and which would have been gradually ſubdued by nature, had it not been unſeaſonably rouzed, and aſſiſted by ſome ingredient, that perhaps was without any reaſon added to the medicine. See MEDICINE.

MIXTURA SIMPLEX, a medicinal preparation, made in the following manner: Take of the ſpiritus theriacalis camphoratus of Bates, ten ounces; ſpirit of vitriol, two ounces; rectified ſpirit of tartar, ſix ounces. Digeſt in a glaſs-veſſel, hermetically ſealed, for three weeks. This medicine excites ſweat, reſiſts putrefaction, and is good in malignant fevers. The doſe is about a dram.

MIZEN, in the ſea-language, is a particular maſt or ſail. The mizen-maſt ſtands in the ſternmoſt part of the ſhip. In ſome great ſhips there are two of theſe; when that next the main-maſt is called the main-mizen, and that next the poop, the bonaventure-mizen. The length of the mizen-maſt, is, by ſome, accounted the ſame with the height of the main top-maſt from the quarter-deck; or half the length of the main-maſt, and half as thick. The ſail which belongs to the mizen-maſt, is called the mizen-ſail: and when the word mizen is uſed at ſea, it always means the ſail. The uſe of the mizen is to keep the ſhip cloſe to the wind, or when a ſhip rides at anchor, to back her a-ſtern, ſo that ſhe may not foul her anchor, on the turning of the tide. The term mizen is uſed in the following phraſes: ſet the mizen, that is, fit the mizen-ſail right as it ſhould ſtand. Change the mizen, or bring the mizen-yard over to the other ſide of the maſt. Peak the mizen, or put the mizen-yard right up and down by the maſt. Spell the mizen, or let go the ſheet and peak it up.

MNEMONIC, ſomething relating to memory. See the article MEMORY.

MNIUM, in botany, a genus of moſſes, conſiſting of ſtalks furniſhed with leaves, and producing capſules raiſed on pedicles, like thoſe of the other moſſes of this claſs; but beſides theſe, there are other pedicles, bearing a kind of naked heads, with a duſty ſurface, and having no calyptræ. Theſe two kinds of heads are, in ſome ſpecies, produced on the ſame plant; and in others, on different plants of the ſame ſpecies. The pedicles that ſupport the capſules are long, and naked; whereas thoſe ſupporting the duſty heads are ſhort, and in ſome ſpecies furniſhed with ſhort leaves. See plate CLXXX. fig. 3.

MOAR-LOVRE, in huſbandry, a ſort of blight, which happens moſtly on light land, from the earth's ſinking away from the roots, ſo that the plants fall down to the earth.

To remedy this, they turn a ſhallow furrow againſt the rows, when they are ſtrong enough to bear it, and when the mould is fine and dry, for then the motion of the ſtalks by the wind will cauſe ſuch earth to run through the rows, and ſettle about the roots, and cover them.

MOARING, or MOORING, in the ſea-language. See the article MOORING.

MOAT, or DITCH, in fortification, a deep trench dug round the rampart of a fortified place, to prevent ſurprizes.

The brink of the moat, next the rampart, is called the ſcarpe; and the oppoſite one, the counterſcarpe.

A dry moat round a large place, with a ſtrong garriſon, is preferable to one full of water; becauſe the paſſage may be diſputed inch by inch, and the beſiegers when lodged in it, are continually expoſed to the bombs, granades, and other fire-works, which are thrown inceſſantly from the rampart into their works. In the middle of dry moats, there is ſometimes another ſmall one, called cunette; which is generally dug ſo deep, till they find water to fill it.

The deepeſt and broadeſt moats are accounted the beſt, but a deep one is preferable to a broad one: the ordinary breadth is about twenty fathoms, and the depth about ſixteen.

To drain a moat that is full of water, they

they dig a trench deeper than the level of the water, to let it run off; and then throw hurdles upon the mud and ſlime, covering them with earth or bundles of ruſhes, to make a ſure and firm paſſage.

MOBILE, or PRIMUM MOBILE, the ninth ſphere in the ptolemaic ſyſtem of aſtronomy. See the article PTOLEMAIC.

Perpetual MOBILE, or MOVEMENT. See the article MOVEMENT.

MOBILIA, in law, the ſame with moveables. See MOVEABLE GOODS.

MOCO, or MOCHO, a great city and port-town of Arabia Fœlix, ſituated near the ſtraits of Babelmandel, at the entrance of the Red-Sea: eaſt long. 45°, north lat 13°.

MODAL PROPOSITIONS, in logic, ſuch as include certain reſtrictions. See the article PROPOSITION.

MODBURY, a market-town of Devonſhire, 32 miles ſouth-weſt of Exeter.

MODE, *modus*, in philoſophy, denotes the manner of a thing's exiſtence, which is twofold, *viz.* ſimple or mixed.

Simple modes are only combinations of the ſame ſimple idea: thus by adding units together, in diſtinct ſeparate collections, we come by all the ſeveral modes of numbers, as a *dozen*, a *ſcore*, a *thouſand*, &c. Mixed modes, on the contrary, are compounded of ſimple ideas of different kinds, as *beauty*, which conſiſts in a certain compoſition of colour and figure, cauſing delight in the beholder: ſuch alſo is *theft*, which is the concealed change of the poſſeſſion of a thing, without the conſent of the proprietor.

Concerning ſimple modes, Mr. Locke obſerves, that they are as perfectly different and diſtinct ideas in the mind, as thoſe of the greateſt diſtance and contrariety: thus *two* is as diſtinct from *three*, as blueneſs from heat.

To the head of ſimple modes, the ſame great philoſopher refers ſpace and extenſion, duration, and its ſimple modes, numbers, infinity, &c. alſo thinking, motion, ſound, colour, pleaſure, pain, &c. See SPACE, DURATION, &c.

There are three ways, he obſerves, whereby we get the complex ideas of mixed modes. 1. By experience and obſervation of things themſelves: thus, by ſeeing two men wreſtle, or box, we get the ideas of wreſtling or boxing. 2. By invention, or voluntarily putting together of ſeveral ſimple ideas in the mind: thus, he that firſt invented printing, muſt have had an idea of it in his mind before it ever exiſted; for the mind being once furniſhed with ſimple ideas, can put them together in ſeveral compoſitions, without examining whether they exiſt ſo together in nature: and hence it is, that ſuch ideas are called notions, as if they exiſted more in the minds of men than in the reality of things; and to form them, the mind only joins their ſeveral parts, without conſidering whether they have any real exiſtence. 3. By explaining the names of actions we never ſaw, or notions which we cannot ſee; and by enumerating all the ideas that go to make them up: thus the mixed mode, which the word *lie* ſtands for, is made up of theſe ſimple ideas; articulate ſounds; certain ideas in the mind of the ſpeaker; thoſe words, the ſigns of theſe ideas; thoſe ſigns put together by affirmation or negation, otherwiſe than the ideas they ſtand for are in the mind of the ſpeaker.

Mixed modes have their unity from an act of the mind, combining thoſe ſeveral ſimple ideas together, and conſidering them as only one complex idea; and the mark of this union is one name given to that combination, whereby men endeavour to communicate their thoughts to one another with all poſſible diſpatch: and hence appears the reaſon why there are words in every language, which cannot be rendered by any ſingle word of another; becauſe the faſhions and cuſtoms of one nation make ſeveral combinations, which another nation had never any occaſion to make; as the oſtraciſm, οστρακισμος, among the Greeks; and proſcription, among the Romans. This alſo occaſions the conſtant change of languages; becauſe the change of cuſtoms and opinions brings with it new combinations of ideas, which, to avoid long deſcriptions, have new names annexed to them. See WORD, LANGUAGE, &c.

Actions being the buſineſs of mankind, it is no wonder that their ſeveral modes ſhould be treaſured up in the memory, and have diſtinct names aſſigned them, derived from their cauſes, means, objects, ends, inſtruments, time, place, and other circumſtances. The powers too, fitted for theſe actions, form likewiſe diſtinct modes: thus boldneſs is the power to do or ſpeak what we intend, without fear or diſorder.

The efficacy whereby the new idea is produced, is called, in the ſubject exerting

erting that power, action; but in the ſubject wherein any ſimple idea is changed or produced, paſſion; which efficacy, in intellectual agents, can be nothing but modes of thinking and willing; and in corporeal agents, nothing but modifications of motion. Of any other ſort of action, we have no notion or idea; and therefore, many words, which ſeem to expreſs ſome action, ſignify only the effect, with ſome circumſtances of the ſubject wrought on, or cauſe operating. Thus creation, annihilation, &c. contain in them no idea of the action or manner, whereby they are produced; but barely of the cauſe, and the thing produced. In the ſame manner, when an ignorant perſon ſays that the cold freezes water, though the word freezing ſeem to import ſome action, yet it truly ſignifies nothing but the effect, *viz.* that the water, which was before fluid, is become hard and conſiſtent, without containing any idea of the action whereby it is done.

There are numerous other diviſions of modes, into immediate and mediate; eſſential and non-eſſential; poſitive and privative; of ſpirit and body; of thinking, &c.

Immediate MODES, are thoſe immediately attributed to their ſubjects, as motion in a body, knowledge, &c.

Mediate MODES, are thoſe attributed to ſubjects by the intervention of ſome other mode, as ſwiftneſs and ſlowneſs, which are attributable to a body, only in reſpect of motion.

Eſſential, or *inſeparable* MODES, are attributes without which the ſubſtance cannot ſubſiſt, as wiſdom, &c. in God, &c.

Non-eſſential, or *ſeparable* MODES, are attributes affecting created ſubſtances, and affixed thereto as long as is neceſſary, as coldneſs in water, &c.

Poſitive MODES, are thoſe which give ſomething poſitive to their ſubſtance, as roundneſs in a globe.

Privative MODES, are attributed to ſubjects, when the mind, perceiving ſomething wanting therein, frames a word which at firſt ſight ſeems to note ſomething poſitive, but in reality denotes the want of ſome mode.

MODES *of ſpirit* are two, knowledge and willing.

MODES *of body* are three, figure, reſt, and motion.

MODE, or MOOD *of ſyllogiſms*, among logicians. See SYLLOGISM.

MODE, in muſic, is defined to be a particular manner of conſtituting the octave; or, it is the melodious conſtitution of the octave, as it conſiſts of ſeven eſſential ſounds, beſides the key or fundamental. See the article OCTAVE.

A mode, then, is the particular order of the concinnous degrees of an octave; the fundamental note whereof may be called the key, as it ſignifies that principal note which regulates the reſt.

The proper difference, therefore, between a mode and a key is this, that an octave, with all its natural and concinnous degrees, is called a mode, with reſpect to the conſtitution or manner of dividing it; and, with reſpect to its place in the ſcale, it is called a key. Now it may be farther obſerved, that, of the natural notes of every mode, three go under the name of the eſſential notes, namely, the fundamental, the third and fifth; their octaves being reckoned the ſame, and marked with the ſame letters in the ſcale; the reſt are called dependents: Again, the fundamental is alſo called the final, the fifth the dominante; and the third, as being between the other two, the mediante.

The doctrine of the antients, with regard to modes, is ſomewhat obſcure.

Muſic was conſiderably improved in the eleventh century by Guido Aretinus, who, among other innovations, reformed the doctrine of modes. It is true, their number was fixed to ſeven; but afterwards conſidering the harmonical and arithmetical diviſions of the octave, whereby it reſolves into a fourth above a fifth, or a fifth above a fourth, they hence conſtituted twelve modes, making of each octave two different modes; but, becauſe there are two of them that cannot be divided both ways, there are but twelve modes. Of theſe ſuch as were divided harmonically, that is, with the fifths loweſt, which were ſix, were called authentic; and the other ſix, which had the fifths higheſt, were called plagal modes.

To

To these modes they gave the names of the antient greek towns, as Dorian, Phrygian, Lydian. But the several authors differ in the application and order of these names; so that we are still at a loss, what their real use was.

All we know is, they considered that an octave which wants a fourth or fifth is imperfect; these being the concords next to the octave, the song ought to touch those chords most frequently; and because the concord is different, which makes the melody different, they established by this two modes in every natural octave that had a true fourth or fifth: Then, if the song was carried as far as this octave above, it was called a perfect mode; if less, as to the fourth or fifth, it was called imperfect; if it moved both above and below, it was called a mixed mode. Others considering how indispensable a chord the fifth is in every mode, took for the key-note, in the arithmetically divided octaves, not the lowest chord of that octave, but that very fourth. The only difference then in this method between the authentic and plagal modes is, that the authentic goes above its final to the octave; the other ascends a fifth, and descends a fourth: which will indeed be attended with different effects, but the mode is essentially the same, having the same final to which all the notes refer.

The modes of authentic or plagal differ among themselves, either by standing higher or lower in the scale, that is, by the different tension of the whole octave, or rather by the different subdivision of the octave into its concinnous degrees.

That one mode should produce mirth, another sadness, and that a third should be proper for religion, a fourth for love, &c. that these effects are owing merely to the constitution of the octave, scarce any body will affirm. The differences in the constitution will, it is true, have some little influence; the greatest difference is that of those octaves which have the 3d *l*, or 3d *g*, making what on other occasions we call the sharp and flat key. It is particularly observable that those who give us examples in actual composition of their twelve modes, frequently take in the artificial notes ♯ and ♭ to perfect the melody of their key, and by this means depart from the constitution of the octave, as it stands fixed in the natural system. Therefore, the modes are all really reducible to two, *viz.* the sharp and flat; the other differences respecting only the place of the scale, where the fundamental is taken.

Originally, there were but three antient modes, namely, the Doric, Lydian, and Phrygian, which were particularly called tones, as being at a tone's distance from each other: the rest were afterwards added, and denominated from the relation they bore to the former, particularly the Hypodoric, as being below the Doric. Besides these modes of tune, there were modes of time, at first distinguished into greater and lesser; and each of these again into perfect and imperfect. But afterwards they were reduced to four, which are now disused.

The common mode now in use is much more simple than any of those; the proportion, which in theirs is varied, being in ours fixed, namely, 2 : 1. A large is equal to 2 longs, a long to two breves, a breve to 2 semi-breves, &c. And, if on some occasions, the proportion of 3 : 1 betwixt two successive notes is required, it is easily expressed by annexing a point, thus (.) See the articles TIME, CHARACTER, &c.

The antients had also their modi melopœi, as dithyrambic, comic, and tragic; so called from their expressing the several affections of the mind.

MODEL, in a general sense, an original pattern, proposed for any one to copy or imitate.

This word is particularly used, in building, for an artificial pattern made in wood, stone, plaster, or other matter, with all its parts and proportions, in order for the better conducting and executing some great work, and to give an idea of the effect it will have in large. In all great buildings, it is much the surest way to make a model in relieve, and not to trust to a bare design or draught. There are also models for the building of ships, &c. and for extraordinary stair-cases, &c.

They also use models, in painting and sculpture, whence, in the academies, they give the term model to a naked man or woman, disposed in several postures to give an opportunity to the scholars to design him in various views and attitudes.

MODENA, a dutchy of Italy, bounded by Mantua on the north, by Romania on the east, by Tuscany and Lucca on the south, and by Parma and the territory of Genoa on the west.

MODENA, the capital of the dutchy of that name,

name, ſituated in 11° 20′ eaſt long. and 44° 45′ north lat.

MODERATA MISERICORDIA, in law, a writ that lies where one is amerced in a court-baron, or other court, not being of record, for any fault or tranſgreſſion beyond the quality and quantity of that offence; and is directed to the lord of the court or his ſteward, commanding them to take a moderate amercement of the party.

MODERATOR, in the ſchools, the perſon who preſides at a diſpute, or in a public aſſembly: thus the preſident of the annual aſſembly of the church of Scotland, is ſtiled moderator.

MODERATOR-RING, in anatomy, is uſed by Valſalva for that ring which the muſcles of the eye make round the optic nerve at the bottom of the orbit.

MODERN, in a general ſenſe, ſomething new, or of our time, in oppoſition to what is antique or antient.

MODICA, a town of Sicily, in the province of Noto, twenty-five miles ſouth of Syracuſe.

MODIFICATION, in philoſophy, that which modifies a thing, or gives it this or that manner of being.

Quantity and quality are accidents which modify all bodies. According to Spinoſa's ſyſtem all the beings that compoſe the univerſe are only ſo many different modifications of one and the ſame ſubſtance; and it is the different arrangement, and ſituation of their parts, that make all the difference between them.

MODILLIONS, in architecture, ornaments in the corniche of the ionic, corinthian, and compoſite columns. See IONIC, CORINTHIAN and COMPOSITE.

The modillions are little inverted conſoles, or brackets, in form of an S under the ſoffit of the corniche, ſeeming to ſupport the projecture of the larmier; tho' in reality they are no more than ornaments. See plate CLXXXI. fig. 3.

They ought always to be placed over the middle of the column. They are particularly affected in the corinthian order, where they are uſually enriched with ſculpture. Their proportions ought to be ſo adjuſted, as to produce a regularity in the parts of the ſoffits. The intermodillions, *i. e.* the diſtances between them, depend on the inner columns, which oblige the modillions to be made of a certain length and breadth, in order to render the intervals perfect ſquares, which are always found to have better effects than parallelograms. To this it muſt be added, that in adjuſting the modillions, care ſhould be taken that they have ſuch a proportion as that when the orders are placed over one another, there be the ſame number in the upper order as in the lower, and that they fall perpendicularly over one another.

Modillions are alſo uſed under the corniches of pediments, though Vitruvius obſerves that they were not allowed in his time, becauſe modillions were intended to repreſent the ends of rafters. Daviler rather takes them for a kind of inverted conſoles, or corbels. The modillion is ſometimes called a mutule, though cuſtom has introduced a little difference between the idea of a modillion and a mutule; the mutule being peculiar to the doric order, and the modillions to the higher orders. In the ionic and compoſite orders, modillions are more ſimple, having ſeldom any ornaments except ſometimes a ſingle leaf underneath. M. Le Clerc obſerves on the corinthian order, that it is uſual to have a leaf that takes up their whole breadth, and almoſt their whole length too; but he is of opinion, that the modillions would be more graceful, if this leaf was leſs both in length and breadth.

MODIOLUS, in ſurgery, an inſtrument otherwiſe called a trepan. See the article TREPAN.

MODIUS, in antiquity, a kind of dry meaſure, in uſe among the Romans, for ſeveral ſorts of grain. See MEASURE.

MODO ET FORMA, *in manner and form*, among lawyers, are words of art frequently uſed in pleadings, *&c.* and particularly in a defendant's anſwer, wherein he denies to have done what is laid to his charge in manner and form, as affirmed by the plaintiff.

MODON, a city and port-town of european Turky, ſituated in the Morea, twenty miles weſt of Coron: eaſt long. 21° 30′, north lat. 37°.

MODULATION, in muſic, the art of keeping in, or changing the mode or key. See the articles KEY and MODE.

Under this term is comprehended, the regular progreſſion of ſeveral parts, thro' the ſounds that are in the harmony of any particular key, as well as the proceeding naturally and regularly from one key to another; the rules of modulation, in the firſt ſenſe, belonging to harmony and melody. See the articles HARMONY and MELODY.

We ſhall here only add a few words with regard to the rules of modulation, in the latter ſenſe. As every piece muſt have a particular key, and ſince the variety ſo neceſſary in muſic to pleaſe and entertain forbids the being confined to one key, and that therefore it is not only allowable but neceſſary to modulate into, and make cadences on ſeveral keys having a relation and connection with the principal key, it muſt be conſidered what it is that conſtitutes a connection between the harmony of one key and that of another, that it may be hence determined into what keys the harmony may be conducted with propriety.

As to the manner in which modulation from one key to another is performed, ſo that the tranſition may be eaſy and natural, it is not eaſy to fix any preciſe rules; for though it is chiefly performed by the help of the ſeventh greater of the key, into which the harmony is to be changed, whether it be ſharp or flat, yet the manner of doing it is ſo various and extenſive, as no rules can circumſcribe. A general notion of it may be conceived under the following terms: the ſeventh greater in either a ſharp or flat key, is the third greater to the fifth of the key by which the cadence is chiefly performed, and by being only a ſemitone major below the key, is thereby the moſt proper note to lead into it, which it does in the moſt natural manner imaginable, inſomuch that the ſeventh greater is never heard in any of the parts, but the ear expects the key ſhould ſucceed it: for whether it be uſed as a third or a ſixth, it always affects us with ſo imperfect a ſenſation, that we naturally expect ſomething more perfect to follow it, which cannot be more eaſily and ſmoothly accompliſhed than by the ſmall interval of a ſemitone major to paſs into the perfect harmony of the key. Hence it is that the tranſition into any key is beſt effected by introducing its ſeventh greater, which ſo naturally leads to it.

MODULE, in architecture, a certain meaſure or bigneſs, taken at pleaſure, for regulating the proportions of columns, and the ſymmetry or diſpoſition of the whole building. Architects generally chooſe the ſemi diameter of the bottom of the column for their module, and this they ſub-divide into parts or minutes. The module of Vignola, which is a ſemi-diameter, is divided into twelve parts in the tuſcan and doric, and into eighteen for the other orders. The module of Palladio, Scamozzi, M. Cambray, Deſgodetz, Le Clerc, &c. which is alſo equal to the ſemi-diameter, is divided into thirty parts or minutes in all the orders. The whole height of the column is divided by ſome into twenty parts for the doric, twenty-two and a half for the ionic, twenty-five for the roman, &c. and one of theſe parts is made a module, to regulate the reſt of the building by.

There are two ways of determining the meaſures, or proportions of buildings. The firſt is by a fixt ſtandard-meaſure, which is uſually the diameter of the lower part of the column, called a module, ſub-divided into ſixty parts called minutes. In the ſecond there are no minutes, nor any certain or ſtated diviſion of the module, but it is divided occaſionally into as many parts as are judged neceſſary; thus the height of the attic baſe, which is half the module, is divided either into three, to have the height of the plinth, or into four, for that of the greater torus; or into ſix, for that of the leſſer. Both theſe manners have been practiſed by the antient as well as the modern architects, but the ſecond, which was that chiefly uſed among the antients, is, in the opinion of M. Perrault, the preferable. As Vitruvius has leſſened his module in the doric order, which is the diameter of the lower part of the other orders, and has reduced that great module to a mean one, which is the ſemi-diameter, the module is here reduced to the third part, for the ſame reaſon, *viz.* to determine the ſeveral meaſures without a fraction. For in the doric order, beſides that the height of the baſe, as in the other orders, is determined by one of thoſe mean modules, the ſame module gives likewiſe the height of the capital, architrave, triglyphs, and metopes. But our little module, taken from the third of the diameter of the lower part of the column, has uſes much more extenſive; for by this the height of the pedeſtals or columns and entablatures in all the orders are determined without a fraction. As then the great module or diameter of the column has ſixty minutes, and the mean module, or half the diameter, thirty minutes, our little module has twenty.

MODUS DECIMANDI, in law, is where money, land, or other valuable conſideration has been given, time out of mind, to the miniſter or parſon of any certain place in the room of tithes. A clergy-

man may ſue in a ſpiritual court for a modus decimandi; yet if the modus is denied there, or a cuſtom is to be tried, the trial thereof belongs to the courts of common law. When lands are converted to other uſes, as in the caſe of hay-ground turned into tillage, the modus may be diſcharged, and the tithes paid again in kind.

MOEDORE, or MOIDORE. See the article MOIDORE.

MOHERINGIA, MOSSY CHICKWEED, in botany, a genus of the octandria-digynia claſs of plants, the flower of which is compoſed of four ſhort, undivided petals; and its fruit is a ſubgloboſe capſule, with one cell, in which are contained numerous roundiſh ſeeds.

It is called by ſome alſine muſcoſa.

MOFFAT, a village in the ſhire of Annandale, thirty-ſix miles ſouth-weſt of Edinburgh; famous for its mineral wells, one of which is uſed for bathing, and the water of the other is taken inwardly. Theſe waters are of great ſervice in gripings of the guts, colics, and pains in the ſtomach. Thoſe who are troubled with obſtructions, rheumatic pains and aches, find great relief both from bathing and drinking; nor is this water a leſs ſovereign remedy in ſcorbutic caſes, and the king's evil. Theſe wells, in the opinion of Dr. Plummer, profeſſor of medicine in the univerſity of Edinburgh, owe their virtues to a ſulphureous principle.

MOGULS, or MONGULS, hoards or tribes of vagrant Tartars, on the north of India, from whom the moguls or ſovereigns of India, as well as of the Uſbec-Tartars, are deſcended.

MOHAIR, in commerce, the hair of a kind of goat, frequent about Angoura, in Turky; the inhabitants of which city are all employed in the manufacture of camblets, made of this hair. See the articles HAIR and CAMBLET.

Some give the name mohair to the camblets or ſtuffs made of this hair; whereof the unwatered kind pays $6\frac{93}{100}$ d. per yard on importation, and draws back, on exportation, $6\frac{7\frac{1}{2}}{100}$ d. The watered ſort pays on importation $11\frac{55}{100}$ d. per yard, and draws back, on exportation, $10\frac{12\frac{1}{2}}{100}$ d.

And that made of half hair, half ſilk, pays, on importation, 2 s. $10\frac{55}{100}$ d. per yard, and draws back, on exportation, 2 s. $7\frac{1}{2}$ d.

MOHAIR-SHELL, in natural hiſtory, a ſpecies of voluta. See VOLUTA.

MOHATS, a town of Lower Hungary, ſituated on the Danube: eaſt long. 20°, north lat. 46° 16′.

MOHAWK-COUNTRY, a part of North America, inhabited by one of the five nations of the Iroquois, in alliance with and ſituated between the province of New York and the lake Ontario, or Frontignac.

MOHILA, one of the Comora-iſlands in the Indian ocean, ſituated between Madagaſcar and the continent of Africa: eaſt long. 43° 30′, ſouth lat. 12°.

MOHILOW, or MOGILOF, a city of Poland, in the province of Lithuania, ſituated fifty miles ſouth of Orſa.

MOIDORE, or MOEDORE, a portugueſe goid-coin. See the article COIN.

MOIETY, *medietas*, the half of any thing. See the article MEDIETAS.

MOINEAU, in fortification, is a flat baſtion raiſed between two other baſtions, when a re-entering angle before a curtain is too long. The moineau is commonly joined to the curtain, but it is ſometimes ſeparated from it by a foſs, in which caſe it is called a detached baſtion. The moineau is not raiſed ſo high as the works of the place, becauſe it ought to be expoſed to the fire of the place in caſe the enemy ſhould lodge themſelves in it.

MOISTURE, a term ſometimes uſed to denote animal fluids, the juices of plants, or dampneſs of the air or other bodies.

Radical MOISTURE, among phyſicians, ſignifies a vital fluid, which nouriſhes and maintains life, as oil does a lamp. However, Dr. Quincy obſerves, that ſuch a fluid is a mere chimera, unleſs we thereby mean the maſs of blood. See the article BLOOD.

MOLA, in geography, a town of Italy, ſeven miles eaſt of the city of Barri, in the kingdom of Naples.

MOLA, in anatomy, the ſame with patella. See the article PATELLA.

MOLA, the SUN-FISH, in ichthyology, a ſpecies of oſtracion, of a compreſſed, roundiſh figure, with four holes on the head.

This is a very ſingular fiſh, weighing often more than an hundred pounds: its figure, at firſt ſight, more reſembles the head of ſome large fiſh, cut off from the body, than that of a complete animal.

MOLA, a mole, in medicine. See the article MOLE.

MOLARES,

MOLARES, or DENTES MOLARES, in anatomy, the large teeth called in engliſh grinders. See the article TOOTH.

MOLARIS LAPIS, the mill-ſtone. See the article MILL-STONE.

MOLASSES, or MOLOSSES. See the article MOLOSSES.

MOLD, or MOULD. See MOULD.

MOLDAVIA, a province of european Turky, ſeparated from Poland by the river Neiſter.

MOLE, *talpa*, in zoology, makes a genus of quadrupeds, of the order of the feræ, thus characterized: the feet are formed like hands, and calculated for digging; and it has no external ears.

Of this genus there are two ſpecies. 1. The common mole, a well known little animal, of a bluiſh-black colour, very miſchievous to the farmers, by throwing up the ground of their paſtures. 2. The pointed tail-leſs mole, ſomewhat larger than the common kind: it is of a mixed colour, in which a purpliſh and yellowiſh tinge ſeem the prevailing ones: it is a native of Aſia, and lives under ground, like the common mole.

MOLE CRICKET, the ſame with gryllo talpa. See GRYLLO TALPA.

MOLE, *mola carnea*, in medicine, a maſs of fleſhy matter, of a ſpherical figure, generated in the uterus, or womb, and ſometimes miſtaken for a child. Its ſize is various, from that of a large nut to that of a fœtus. Some moles are ſoft and ſpungy, and others membranous, with a cavity in the middle. Sometimes they are filled with ſerous matter, and ſometimes with hydatides.

The ſymptoms of a mole, at firſt, are like thoſe of a real pregnancy; but afterwards they vary, for the woman feels a dull heavy weight like that of a ball of lead; her belly being round and ſpherical, without any motion like that of a living fœtus.

The mole itſelf threatens no danger, all the difficulty lying in being delivered of it. Some women are troubled with them for ſeveral years, and others all their life, without any other inconvenience than uneaſineſs and weight.

The cure conſiſts in expelling the mole; for which purpoſe the aſſiſtance of an expert midwife or ſurgeon becomes neceſſary. If the mouth of the uterus ſhould be too ſtrongly contracted to admit the hand of the operator, it is proper to excite the woman's throws by briſk cathartics and ſtrong clyſters; while the os uteri, and parts adjacent, are in the mean time gradually relaxed by the application of emollient fomentations, &c. which done, one or two of the fingers are to be firſt gently inſinuated, and then the whole hand by degrees, in order to extract the mole, as directed for the ſœtus. See the article DELIVERY.

If the mole adheres to the uterus, as it frequently does, it is to be gently ſeparated before extraction; and if it be too large to be got out entire, it may be carefully ſeparated and extracted in pieces, either with the fingers, or a falciform hook. To conclude, ſays Heiſter, if a mole does not occaſion any bad ſymptoms, or uneaſineſs in the mother, and its extraction appears difficult, no violence ſhould be uſed; ſince we have many inſtances of moles retained in the uterus, without any great detriment to the patient, as long as they lived.

MOLE, in geography, a river in Surrey, ſo called from its running, for part of its courſe, under ground.

MOLE, *moles*, is alſo a maſſive work of large ſtones laid in the ſea by means of cofferdams; extending before a port, either to defend the harbour from the impetuoſity of the waves, or to prevent the paſſage of ſhips without leave.

MOLE, *moles*, in antiquity, a kind of mauſoleum, in form of a round tower, built upon a ſquare baſe.

MOLINA, a city of Spain, eighty five miles north-eaſt of Madrid.

MOLINE, or CROSS-MOULIN, in heraldry, the ſame with that called fer de moulin. See the article FER DE MOULIN.

MOLISE, a city of Italy, fifty miles north-eaſt of the city of Naples.

MOLLEN, a town of Lower Saxony, ſixteen miles north of Lawenberg.

MOLLUGO, BASTARD-MADDER, in botany, a plant of the triandria-trigynia claſs, without any flower petals: its fruit is a capſule of a ſomewhat oval figure, with three cells; in each of which there are a number of kidney-ſhaped ſeeds.

It is ſaid to have the ſame medicinal virtues as madder. See MADDER.

MOLOSSES, in commerce, the thick fluid matter remaining after the ſugar is made, reſembling ſyrup. See SUGAR.

In Holland moloſſes are much uſed in the manufacture of tobacco, and by the poor people for ſugar. A brandy is alſo diſtilled from them, but it is ſaid to be unwholeſome. See the articles BRANDY, DISTILLATION, &c.

Moloſſes imported from the britiſh plantations, pay per ton 2l. 11s. 4d. and draw back, on exportation, 2l. 5s. Moloſſes from any other place, pay, on importation, 10l. 1s. 4d. per ton; and draw back, on exportation, 9l. 15s.

MOLOSSUS, in greek and latin poetry, a foot compoſed of three long ſyllables, as *delectant*.

MOLTA, or MOLTURA, a toll or duty formerly paid by vaſſals to their lord, for grinding their corn in his mill.

MOLTING, the change of feathers, hairs, or horns, in birds and beaſts. See the article MEWING.

MOLUCCA-ISLANDS, five iſlands in the Indian ocean, the largeſt of which is ſcarce thirty miles round; they are called Bachian, Machian, Motyr, Ternate, and Tydor; they produce ſago, oranges, lemons, and ſome other fruits; but what is peculiar to theſe iſlands, is their producing cloves. They are ſubject to the Dutch, and are ſituated in 125° of eaſt longitude, and between 50′ ſouth, and 2° north latitude.

MOLUCCA-BEANS, *moluccella*, in botany, a genus of the didynamia-gymnoſpermia claſs of plants, the flower of which is monopetalous and labiated; the upper lip being entire, and the lower one trifid: the ſeeds are turbinated, and contained in the bottom of the cup.

MOLWITZ, a town of Sileſia, in the kingdom of Bohemia: eaſt long. 16° 45′, north lat. 50° 26′.

MOLY, in botany, a ſpecies of allium, or garlic.

MOLYBDIA, in natural hiſtory, the name of a genus of cryſtals, of a cubic form, or compoſed of ſix ſides, at right angles, like a die. See CRYSTAL.

Of this genus there are three known ſpecies. 1. A colourleſs one, compoſed of extremely fine cruſts. This is found in many parts, both of this and other kingdoms, where there are lead-mines; and tho' naturally colourleſs, is ſometimes tinged with a red, green, or blue. 2. A dull one with thicker cruſts, ſometimes whitiſh, and ſometimes coloured to a yellowiſh or other hue. This is found in the lead-mines of Yorkſhire, and ſome other places. And 3. A dull bluiſh white one, with very thick cruſts. This is very frequent in the lead-mines in Derbyſhire, and is generally found in large cluſters.

MOMBAZA, or MONBASA, an iſland and city on the eaſt coaſt of Africa, oppoſite to the country of Mombaza, in Zanguebar: eaſt long. 48°, north lat. 4°.

MOMBAZA, a ſub-diviſion of Zanguebar, ſubject to the Portugueze.

MOMENT, in the doctrine of time, an inſtant, or the moſt minute and indiviſible part of duration. See TIME.

Strictly ſpeaking, however, a moment ought not to be conſidered as any part of time, but only as the termination or limit thereof.

MOMENT, in the doctrine of infinites, denotes the ſame with infiniteſimal. See the article INFINITESIMAL.

Leibnitz, and other foreigners, call theſe moments differences. See CALCULUS DIFFERENTIALIS.

MOMENTUM, in mechanics, ſignifies the ſame with impetus, or the quantity of motion in a moving body; which is always equal to the quantity of matter, multiplied into the velocity; or, which is the ſame thing, it may be conſidered as a rectangle under the quantity of matter and velocity. See MOTION.

MOMORDICA, the WILD CUCUMBER, in botany, a genus of the monœcia-ſyngeneſia claſs of plants, with a monopetalous flower, divided into five ſegments: the fruit is an apple, burſting open with great elaſticity, and containing a number of compreſſed ſeeds.

This genus comprehends the momordica and luffa of Tournefort, and the elaterium of Boerhaave; and indeed the elaterium of the ſhops, a violent purge, is the fruit of this plant.

MONA, an iſland in the Baltic, ſouth-weſt of the iſland of Zealand, ſubject to Denmark: eaſt long. 12° 30′, north lat. 55° 20′.

MONACO, a port-town of Italy, in the territory of Genoa; eaſt long. 7° 18′, north lat. 43° 53′.

MONADELPHIA, in botany, a claſs of plants, the ſixteenth in order, ſo called becauſe the ſtamina of the flowers are ſo interwoven as to form one body; or rather, becauſe the ſtamina are connected, or coaleſce at the baſe. See BOTANY.

To this claſs belong the mallow, alcea, althæa, and hibiſcus. See the article MALLOW, &c.

MONAGHAN, a county of Ireland, in the province of Ulſter, bounded by Tyrone, on the north; by Armagh, on the eaſt; by Cavan and Louth, on the ſouth; and by the county of Farmanagh, on the weſt.

MONANDRIA, in botany, a claſs of plants,

plants, the first in order, with only one ſtamen, or male part in each flower.

The monandria are ſubdivided into two orders, which are denominated monandria-monogynia, and monandria-digynia, according as they contain one or two ſtyles. See the article STYLE.

To this claſs belong canna, boerhaavia, &c. See the article CANNA, &c.

MONARCHY, a government in which the ſupreme power is inveſted in a ſingle perſon. There are ſeveral kinds of monarchies, as where the monarch is inveſted with an abſolute power, and is accountable to none but God. It is an error to ſuppoſe, that a deſpotic or abſolute monarch is a ſoleciſm in politics, and that there can be none ſuch legally; for the contrary is true, and that in different parts of the world, and from various principles. In China it is founded on paternal authority, and is the baſis of the government; in Turky, Perſia, Barbary, and India, it is the effect of religion; and in Denmark, the king is legally abſolute by the ſolemn ſurrender which the people made to his predeceſſor of their liberties. Another kind of monarchy is that which is limited, where the ſupreme power is virtually in the laws, though the majeſty of government, and the adminiſtration, is veſted in a ſingle perſon. Monarchies are alſo either hereditary, where the regal power deſcends immediately from the poſſeſſor to the next heir by blood; or elective, where the choice depends upon all who enjoy the benefit of freedom, as in Poland; or upon a few perſons in whom the conſtitution veſts the power of election, as in the german empire. See the articles KING and GOVERNMENT.

MONARDA, in botany, a genus of the diandria-monogynia claſs of plants, with a monopetalous flower, the limb of which is ringent: the ſeeds are four in number, roundiſh, and contained in the bottom of the cup.

MONASTERY, a convent, or houſe built for the reception and entertainment of monks, mendicant friars, or nuns, whether it be an abbey, priory, &c.

Monaſteries are governed by different rules, according to the different regulations preſcribed by their founders. The firſt regular and perfect monaſteries were founded by St. Pachomius, in Egypt: but St. Baſil is generally conſidered as the great father and patriarch of the eaſtern monks; ſince in the fourth century he preſcribed rules for the government of the monaſteries, to which the anachorets and coenobites, and the other antient fathers of the deſarts, ſubmitted: in like manner St. Benedict was ſtiled the patriarch of the weſtern monks; he appeared in Italy towards the latter end of the fifth century, and publiſhed his rule, which was univerſally received throughout the weſt. St. Auguſtin being ſent into England by St. Gregory the pope, in the year 596, to convert the Engliſh, he at the ſame time introduced the monaſtic ſtate into this kingdom, which made ſuch progreſs here, that within the ſpace of two hundred years, there were thirty kings and queens who preferred the religious habit to their crowns, and founded ſtately monaſteries, where they ended their days in ſolitude and retirement.

MONASTIC, ſomething belonging to monks. See the article MONK.

MONBRISON, or MONTHRISON, a town of France, in the province of Lyonois, thirty-ſeven miles ſouth-weſt of Lyons.

MONCON, a town of Spain, in the province of Arragon, fifty miles north-eaſt of Saragoſſa.

MONCONTOUR, a town of France, in the province of Britany, thirty miles ſouth-weſt of St. Malo.

MONDAY, *dies lunæ*, the ſecond day of the week, ſo called as being antiently ſacred to the moon, *q. d.* moon-day. See the articles DAY and WEEK.

MONDEGO, a river of Portugal, which runs through the province of Beira, and falls into the Atlantic ocean thirty miles below Coimbra.

MONDENEDO, a city of Spain, in the province of Galicia, ſeventy miles north-eaſt of Compoſtella.

MONDIDIER, a town of France, in the province of Picardy, eighteen miles ſouth of Amiens.

MONDOVI, a city of Italy, in the territory of Piedmont: eaſt long. 7° 55′, north lat. 44° 35′.

MONEMUGI, a country in the ſouth of Africa, ſituated between Angola and Zanguebar.

MONEY, *moneta*, a piece of matter, commonly metal, to which public authority has affixed a certain value and weight, to ſerve as a medium in commerce.

The æra of the invention of money is not eaſy to be ſettled. There is no room to doubt but that in the earlieſt ages the ordinary way of traffic among men, was by

by trucking or exchanging one commodity for another; but in courſe of time it was found neceſſary, in the way of commutative juſtice, to have ſome common meaſure or ſtandard, according to which all things ſhould be eſtimated. See the article EXCHANGE.

Money is uſually divided into real and imaginary. Real money includes all coins, whether of gold, ſilver, copper, or the like; ſuch as guineas, crowns, piſtoles, pieces of eight, ducats, &c. for an account of which we refer the reader to the article COIN, where we have given tables of the moſt remarkable coins, both antient and modern, with their values in engliſh money. See alſo GUINEA, CROWN, PISTOLE, &c.

Imaginary money, or money of account, is that which has never exiſted, or, at leaſt, which does not exiſt in real ſpecies; but is a denomination invented or retained to facilitate the ſtating of accounts, by keeping them ſtill on a fixed footing, not to be changed like current coins, which the authority of the ſovereigns ſometimes raiſes or lowers, according to the exigencies of the ſtate, of which kinds are pounds, livres, marks, maravedies, &c. See POUND, &c.

Under this diviſion of money we have endeavoured to give an account of all the moſt remarkable imaginary ſpecies in the ſeveral trading places of note in the world; and having made our collection from various authors, we have corrected their errors, which were many, with all poſſible accuracy. And here it is neceſſary to obſerve, that to avoid repetitions, we are obliged to refer the reader to the article COIN, for the ſtating the proportion of the different european monies of account to ſterling money; ſome of this laſt ſpecies of moſt nations in Europe being given there, with its value in engliſh money, which may ſerve to ſettle the ſeveral proportions with the Engliſh.

Engliſh MONEY *of account*, is the pound, ſhilling, and pence; the firſt and laſt being imaginary money, and exchanges calculated in one of them two: the pound contains twenty ſhillings, and the ſhilling twelve pence.

Scotch MONEY *of account*, is the pound, ſhilling, and penny; the pound containing twenty ſhillings, being equivalent to one ſhilling and eight-pence engliſh; and the ſhilling containing twelve pennies, equal to a penny engliſh. There is alſo among them an account of marks, the mark being equivalent to one ſhilling 1⅓ penny engliſh: of this laſt kind they had formerly a ſilver coin. See COIN.

French MONEY *of account*, is in livres, ſols, and deniers, of which twelve deniers make a ſol, and twenty ſols a livre: their exchange is by the crown of three livres, or ſixty ſols.

Dutch MONEY *of account*, is kept, at Amſterdam and Rotterdam, the two chief trading places, in guilders, ſtivers, and penins; ſo that though goods are ſold for other ſpecies, ſuch as livre-de-gros, &c. yet all are reduced to the above denominations for the entries into their books. The exchanges are made with us in ſo many ſhillings to a pound ſterling, though in moſt other places in deniers-de-gros.

Spaniſh MONEY *of account*, is at Cadiz kept in rials of plate and its fractions; at Caſtile, in maravedies; at Valencia, in livres or dollars, ſueldos and dineros; of which laſt, twelve make a ſueldo, and twenty ſueldos a livre or dollar. Seventeen quartos at Cadiz and Caſtile make two rials vellon, which is now an imaginary coin, though formerly it was the principal one of the kingdom. A maravedie is another imaginary ſpecie, of which ſeventeen is reckoned to a rial vellon. The ducat is alſo a fictitious coin of eleven rials of plate in purchaſes, ſales, and other mercantile tranſactions, except in exchanges, when it is valued at eleven rials of plate, and one maravedie, or 375 maravedies.

Portugueſe MONEY *of account*, is kept in reas, or res, making a ſeparation at every hundred, thouſandth, &c. 800 reas go to a moidore.

German and Swiſs MONEY *of account*. At Coningſberg, Elbing, and Dantzick, accounts are kept in rixdollars and gros, or in poliſh guilders, gros, and deniers, or penins. They exchange on Amſterdam in poliſh gros for a livre-de-gros of ſix gilders current money of Amſterdam, and on Hamburgh for the rixdollar. At Lubeck, accounts are kept in marks ſchellings, and deniers or penins-lubs, in which their exchanges are made. At Breſlaw, accounts are kept in rixdollars and ſilver gros and penins; in the firſt of which ſpecies exchanges are made on Amſterdam for a certain number of ſtivers, bank-money, and on Hamburg for rixdollars of Breſlaw, againſt rixdollars of Hamburg bank. At Hamburg, ac-

counts are kept in marks, ſchellings, and deniers-lubs bank-money, by thoſe who have caſh in the bank; but by thoſe who have not, their books are generally kept in rixdollars, ſchellings, and denier current money. At Bremen, accounts are kept in rixdollars and gros, and it exchanges on Amſterdam rixdollars of ſeventy-two gros, for rixdollars of fifty ſtivers banco. At Leipſic and Naumbourg, accounts are kept in rixdollars, crowns, gros, and penins. At Berlin, and in all this kingdom, accounts are kept in guilders, gros, and penins. At Zurich, accounts are kept in rixdollars, creutzers, and hellers; reckoning their rixdollars (worth about 4 s. 6 d. ſterling) at 108 of their creutzers. At Frankfort on the Maine, and Hanaw, accounts are kept in rixdollars and creutzers. At Vienna accounts are kept in guilders, creutzers, and penins, reckoning eight penins to a creutzer, and ſixty creutzers to a guilder. At Nuremberg and Augſbourg, accounts are kept in guilders, creutzers, and hellers; at Liege, in livres, ſols, and deniers.

In the canton of St. Gall, in Switzerland, accounts are kept in guilders, creutzers, and penins; or under the ſame denomination with the coins of the empire. In the canton of Baſil, accounts are variouſly kept, ſome in rixdollars, ſchellings, and deniers; ſome in livres, ſchellings, and deniers; ſome in rixdollars, creutzers, and penins; and ſome in guilders, creutzers, and penins.

Italian MONEY *of account.* In the cities of Genoa and Novi, accounts are kept in livres, ſoldi, and denari; or in dollars of 100 ſoldis. At Milan accounts are kept in livres, ſoldis, and denari, to be counted like pounds, ſhillings, and pence, *viz.* twelve denaris to a ſoldi, *&c.* At Rome, accounts are kept in crowns, julios, and bajoches, or grains and quartrins; the crown is divided into ten julios, and the julio into ten bajoches. At Leghorn, accounts are generally kept in dollars, ſoldi, and denari. At Florence, they keep their books and accounts in crowns, ſoldi, and denari, picoli or current money. At Naples, accounts are kept in ducats, florins, and grains. The accounts in Sicily are kept the ſame as at Naples. At Lucca they keep their accounts in crowns, livres, ſoldi, and denari; the crown is worth 7 livres 10 ſoldi; the livre, 20 ſoldi; and the ſoldi, 12 denari. At Venice, accounts are kept in livres, ſoldi, and denari, picoli, or current; but the bank-entries are in livres, ſoldi, and groſſes: both the current and bank-ducats of Venice make 24 ſoldi, or 6 livres and four ſoldi. At Bologna, accounts are kept in livres, ſoldi, and denari; the livre being 20 ſoldi, and the ſoldi 12 denari. At Bergam, the money of account is the ſame as at Bologna, and its proportions the ſame. At Parma accounts are kept in crowns, ſoldi, and denari; the crown is 20 ſoldi, and the ſoldi 20 denari. At Modena and Mantua, accounts are kept in livres, ſoldi, and denari. In Savoy and Piedmont, accounts are kept in livres or lires, ſoldi, and quartrins. At Placentia, accounts are kept in crowns, ſoldi, and denari of mark; of which 12 denari make a ſoldi, and 20 ſoldi the crown. In the iſland of Sardinia, accounts are kept as in moſt parts of Italy, in livres, ſoldi, and denari. In the iſland of Malta, the money of account is the ſame with that of Sicily. In the iſland of Candia, the account is the ſame as at Venice.

Ruſſian, Swediſh, Daniſh, and Poliſh, MONEY *of account.* In the trading places of the ruſſian empire, accounts are kept in roubles, grives, and moſcoſques, or in roubles and coppecks; 10 coppecks (each of which is equal to 2 moſcoſques) make a grive, and 100 coppecks, or 10 grives, is a rouble. In the kingdom of Sweden, accounts are kept in dollars, marks, and oorts; the dollar being worth 4 marks, and the mark 8 oorts. In Denmark, accounts are kept in marks and ſchellings: the rixdollar is worth ſix marks; the mark, 16 ſchellings; and the ſchelling, 3 penins. Accounts are kept at Bergen, and in other places in Norway, in daniſh rixdollars, marks, and ſchellings. In Poland, accounts are kept in guilders, gros, and deniers, of which 18 deniers make a gros, and 30 gros a guilder: they here keep accounts alſo in rixdollars and gros, reckoning 90 of the latter to one of the former. At Riga, accounts are kept in rixdollars and gros, the former of which ſpecies conſiſts of 90 of the latter.

Turkiſh MONEY *of account.* The Turks, both in Europe, Aſia, and Africa, account by purſes, either of ſilver or gold (the laſt being only uſed in the ſeraglio) with half purſes of gold, called alſo rizes: the purſe of ſilver is equal to 1500 french livres, or about 65 l. ſterling; and the half purſe in proportion: the purſe of gold

gold is 15000 ſequins, equal to 30000 french crowns, or about 3750 l. ſterling: this is ſeldom uſed but for preſents to favourites, ſo that a purſe ſimply ſignifies a purſe of ſilver, or 1500 livres. The merchants alſo uſe dutch dollars, called aſtani or abouquels, with medins and aſpers: the dollar is equal to 35 medins, and the medin to 3 aſpers; the aſper to a halfpenny ſterling money.

Aſiatic MONIES *of account* are as follow. In Perſia, they account by the taman (called alſo man and tumein) and dinar biſti; the taman is compoſed of 50 abaſſis, or 100 mamodies, or 200 chapes, or 10000 dinars; which, accounting the abaſſi on the foot of 18 french ſols, or the dinar on that of a denier, amounts to 3 l. 12 s. 6 d. ſterling the taman. They alſo account by larins, eſpecially at Ormus, and on the coaſt of the Perſian gulph: the larin is equivalent to 11 d. ſterling; and on that footing is uſed alſo in Arabia, and through a great part of the Eaſt-Indies.

Chineſe moneys of account are the pic, picol, and tael; which, though in effect weights, do likewiſe ſerve as money of account, obtaining in Tonquin as well as China: the pic is divided into 100 catis, ſome ſay 125; the cati into 16 taels, each tael equal to one ounce two drachms: the picol contains 66¾ caties; the tael is equivalent to 6 s. 8 d. ſterling.

Japoneſe moneys of account are the ſchuites, cockiens, oebans or oubans, and taels: 200 ſchuites are equal to 500 dutch pounds, the cockien equal to 10 low-country pounds, 1000 oebans make 45000 taels.

Mogul money of account: at Surat, Agra, and the reſt of the eſtates of the great Mogul, they uſe lacres, acrees, or leeths, implying one hundred thouſand; thus a lacre of rupees is 100000 rupees; the lacre being nearly on the footing of the tun of gold in Holland, and the million of France.

Monies of account of other iſlands and coaſts of India. Throughout Malabar, and at Goa, they uſe tangas, vintins, and pardos-xeraphin: the tanga is of two kinds, *viz.* of good and bad alloy; hence their cuſtom is to count by good or bad money; the tanga of good alloy is better by one fifth than the bad, ſo that 4 tangos good being allowed the pardos-xeraphin, there will be required 5 of the bad; 4 vintins good make a tanga likewiſe good; 15 barucos, a vintin; a good baruco is equal to a portugueſe ree, a french denier, or one thirteenth of a penny ſterling. In the iſland of Java they uſe the ſonta, ſapacou, fardos, and catis; which laſt money, together with the leeth or lacre, is much uſed throughout all the Eaſt-Indies: the ſonta is 200 caxas, or little pieces of that country, hung on a ſtring, and is equal to eleven twelfths of a penny ſterling: five ſontas make the ſapacou. The ſardos equal to 2 s. 8 d. ſterling; the cati contains 20 taels; the tael 6 s. 8 d. ſterling. There are iſlands, cities, and ſtates of the Eaſt-Indies, whoſe monies of account are not here expreſſed, partly becauſe reducible to ſome of the above-mentioned, and partly becauſe we find no certain conſiſtent account of them.

African MONEY *of account.* From Cape Verd to the Cape of Good-hope, all exchanges and valuations of merchandize are made on the foot of the macoute and piece; which, though no monies of account (for thoſe barbarians have no real monies, and therefore need no imaginary ones to eſtimate them by) yet ſerve in lieu thereof. At Loango de Boirie, and other places on the coaſt of Angola, the eſtimations are made by macoutes; and at Malimbo and Cabindo, on the ſame coaſt, the negroes reckon by pieces: among the firſt the macoute is equal to 10 pieces; ten macoutes make 100, which likewiſe gives us a kind of imaginary money to eſtimate any purchaſe, exchange, *&c.* they fix on the one ſide the number of macoutes required; *e. gr.* for a negro; ſo that there are ſeveral bargains made for one; ſuppoſe, for inſtance, the ſlave to be fixed at 3500 pieces, this amounts to 350 macoutes; to make up this number of macoutes in merchandize, they fix the price of each in macoutes. Two ſtemiſh knives, *ex. gr.* are accounted one macoute; a copper-baſon, 2 lb. weight, three; a barrel of gun-powder, three, *&c.* For the piece, it ſerves in like manner to eſtimate the value of goods, duties, *&c.* on either ſide: thus the natives require 10 pieces for a ſlave; and the europeans put, for inſtance, a fuſee at 1 piece, a piece of ſalampours at 4 pieces, *&c.* The cities of Barbary and Egypt, whither the europeans traffic, reckon much after the ſame manner as in the Levant and the dominions of the grand ſignior; for the reſt, through that vaſt extent of coaſt where we trade for negroes, gold-duſt, elephant's teeth, wax, leather, *&c.* either the miſerable inhabitants

bitants do not know what money of account is, or, if they have any, it is only what ſtrangers, ſettled among them, have introduced.

MONIES *of account in America.* Here they have no money of their own; the reſpective monies of account of the Europeans, who have made ſettlements there, being eſtabliſhed among them.

MONIES *of account among the antients.* Grecian monies of account. The Greeks reckoned their ſums of money by drachmæ, minæ, and talenta: the drachma was equal to 7¼ d. ſterling; 100 drachmæ made the mina, equal to 3 l. 4 s. 7 d. ſterling; 60 minæ made the talent, equal to 193 l. 15 s. ſterling; hence 100 talents amounted to 19375 l. ſterling.

The mina and talent indeed were different in different provinces: the proportions in attic drachms are as follows; the ſyrian mina contained 25 attic drachms; the ptolemaic, 33⅓; the antiochic and eubœan, 100; the babylonic, 116; the greater attic and tyrian, 133⅓; the æginean and rhodian, 166⅔; the ſyrian talent contained 15 attic minæ, the ptolemaic 20, the antiochic 60, the eubœan 60, the babylonic 70, the greater attic and tyrian 80, the æginean and rhodian 100.

Roman monies of account were the ſeſtertius and ſeſtertium: the ſeſtertius was nearly equal to 2d. ſterling; 1000 of theſe made the ſeſtertium, equal to 8 l. 1 s. 5½ d. ſterling; 1000 of the ſeſtertia made the decies ſeſtertium (the adverb *centies* being always underſtood) equal to 8072 l. 18 s. 4 d. ſterling; the decies ſeſtertium they alſo called the decies centena millia nummum. Centies ſeſtertium, or centies H. S. were equal to 80729 l. 3 s. 4 d. Millies H. S. were equal to 8072921 l. 13 s. 4 d. Millies centies H. S. equal to 8880201 l. 16 s. 8 d.

Falſe, or *Baſe* MONEY, is either that ſtruck by an unqualified perſon, and of unſtatutable metals; or that which has loſt of its weight, either by being clipped on the corners, or filed on the edges; or, laſtly, by having ſome of its ſurface eaten off, if gold, by aqua regia; if ſilver, by aqua fortis. Another kind of baſe money, is that made of pieces of iron, copper, or other metal, covered on each ſide with a thin plate or leaf of gold or ſilver, neatly ſoldered and joined round the edges, and ſtruck, like other coin, with figures, legends, *&c.*

MONEYERS, MONEYORS, or MONIERS, officers of the mint, who work and coin gold and ſilver money, and anſwer all waſte and charges. See MINT.

MONFORTE, the name of two towns in Portugal, the one in the province of Alentejo, and the other in that of Beira.

MONGUL, or MOGUL, a part of Tartary, lying eaſt of India and Perſia.

MONIKEDAM, a town of the united Netherlands, in the province of Holland, eight miles north-eaſt of Amſterdam.

MONITORY LETTERS, are letters of warning and admonition, ſent from an eccleſiaſtical judge, upon information of ſcandals and abuſes, within the cognizance of his court.

MONK, a perſon who wholly dedicates himſelf to the ſervice of religion, in ſome monaſtery, under the direction of ſome particular ſtatutes and rules.

The moſt probable account of the original of the monks is, that in the decian perſecution, in the middle of the IIId. century, many perſons in Egypt, to avoid the fury of the ſtorm, fled to the neighbouring deſarts and mountains, where they not only found a ſafe retreat, but alſo more time and liberty to exerciſe themſelves in acts of piety and divine contemplations; which ſort of life became ſo agreeable, that when the perſecution was over, they refuſed to return to their habitations again, chooſing rather to continue in thoſe cottages and cells, which they had made for themſelves in the wilderneſs. From that time to the reign of Conſtantine, monachiſm was confined to the hermits or anachorets, who lived in private cells in the wilderneſs: but when Pachomius had erected monaſteries, other countries preſently followed the example. See the article MONASTERY.

The manner of admiſſion to the monaſtic life was uſually by ſome change of habit, not to ſignify any religious myſtery, but only to expreſs their gravity and contempt of the world. Long hair was always thought an indecency in men, and ſavouring of ſecular vanity, and therefore they polled every monk at his admiſſion, to diſtinguiſh him from ſeculars; but they never ſhaved them, leſt they ſhould look like the prieſts of Iſis. St. Jerom ſpeaking of the habits of the monks, intimates that it differed from that of others only in this, that it was cheaper, coarſer, and meaner raiment. We read of no ſolemn vow, or profeſſion, required at their admiſſion; but they underwent a triennial probation, during which time they were

inured to the exercises of the monastic life. If, after that time was expired, they chose to continue the same exercises, they were then admitted, without any farther ceremony, into the community. As the monasteries had no standing revenues, all the monks were obliged to maintain themselves by their daily labour: they had no idle mendicants among them, but looked upon a monk who did not work, as a covetous defrauder. Every ten monks were subject to one, who was called the decanus, or dean, from his presiding over ten; and every hundred had another officer called centenarius, from his presiding over an hundred; and above these were the fathers of the monasteries, also called abbots. The business of the deans was to exact every man's daily task, and carry it to the steward, who gave a monthly account of it to the abbot. See the article ABBOT.

For a particular account of the present monastic orders, see AUGUSTINS, BENEDICTINES, CARMELITES, DOMINICANS, FRANCISCANS, &c.

MONK-FISH, *squatina*. See SQUATINA.

MONK-SEAM, among sailors, is the sewing the edges or selvedges of sails together, over one another on both sides, to make it the stronger.

MONKEY, *simia*, in zoology, a numerous genus of quadrupeds of the order of the anthropomorpha, or quadrupeds that resemble the human figure: their face is naked; the claws are rounded and flattish, in some degree like the nails on the human hand; and they have both an upper and lower eye-lid.

Of all the animals of the monkey-kind, the satyr resembles mankind most; its face is naked, and is very like that of an aged and not handsome man; it has no tail, and in other respects greatly resembles the human form. The most like, next to this, is the oran-outang, or black-faced monkey, called the savage; and the next to this is the baboon, or whiskered simia, with a short tail; the rest of the monkeys, of which there are a great many kinds, differing widely both in size and figure, have nevertheless something of the human aspect; and as they are tractable animals, people make them walk erect with a staff, and perform many tricks, to shew their resemblance; but, in general, such monkeys as have no tails, have more of this likeness than those that have. See plate CLXXXI. fig. 1.

MONLUSON, or MOULUCON, a town of the Lyonois, in France, forty-five miles south of Bourges.

MONMOUTH, the capital of Monmouthshire, situated on the river Wye, twenty-five miles north of Bristol.

It sends two members to parliament.

MONOCHORD, a musical instrument, composed of one string, used to try the variety and proportion of sounds.

It is formed of a rule, divided and subdivided into several parts, on which there is a moveable string stretched upon two bridges, at each extreme. In the middle between these is a moveable bridge, by means of which, in applying it to the different divisions of the line, the sounds are found to bear the same proportion to each other, as the division of the line, cut by the bridge. There are also monochords with forty-eight fixed bridges.

The monochord is also called the harmonical canon, or the canonical rule, because it serves to measure the degrees of gravity or acuteness.

Monochord is also used for any musical instrument, that consists of only one string or chord; in this sense the trumpet-marine may properly be called a monochord.

MONOCULUS, in zoology, a genus of crustaceous water-insects of the apteraorder, the body of which is short, roundish, and covered with a firm crustaceous skin; its fore-legs are ramose, and serve for leaping and swimming: and it has only one eye, composed of three smaller ones.

MONODON, in ichthyology, a fish of the whale-kind, otherwise called narwal, or the sea-unicorn. See NARWAL.

MONODY, in antient poetry, a mournful kind of song, sung by a person all alone, to give vent to his grief.

MONOECIA, in botany, one of Linnæus's classes of plants, the twenty-first in order; in which the male and female flowers are placed separately on the same plant, or rather on different stalks growing from the same root.

Of the plants belonging to this class, some have only one stamen, and others have three, four, five, six, or more stamina; whence the subordinate orders of monoecia-monandria, monoecia-triandria, &c. others again are monadelphous, others syngenesious, and others gynandrous.

MONOGAMY, the state or condition of those who have only been once married, and are restrained to a single wife. See the article MARRIAGE.

MONO-

Fig. 1 MONKEYS

Oran Outang

Baboon

Satyr

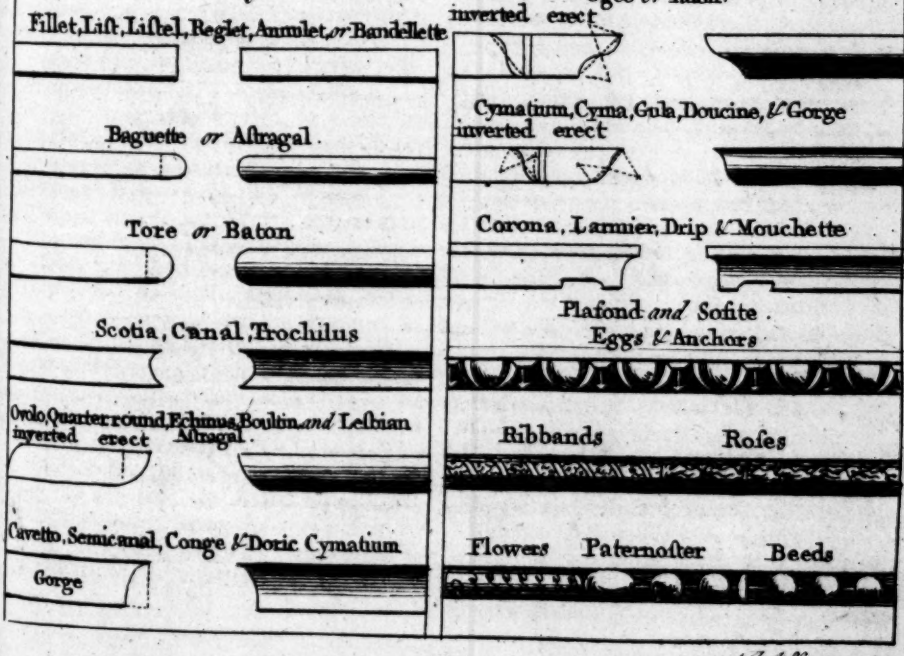
Fig. 2 MULLETS

Fig. 3.

MODILLIONS

of Vignola its Plafond its Plafond of Scammozzi

Fig. 4 MOULDINGS or MEMBERS



T. Jefferys sculp.

BRITISH MUSEUM

MONOGRAM, a character or cypher, compoſed of one, two, or more letters, intervoven; being a kind of abbreviation of a name, antiently uſed as a ſeal, badge, arms, &c.

The uſe of arms is very antient, as appears from Plutarch, and from ſome greek medals of the time of Philip of Macedon and Alexander his ſon. The roman labarum bore the monogram of Jeſus Chriſt, which conſiſted of two letters, a P placed perpendicularly through the middle of an X, as we find it on many medals in the time of Conſtantine, theſe being the two firſt letters of the word ΧΡΙΣΤΟΣ. Thus under the eaſtern empire it is uſual to find MIK, which are the monogram of Mary, Jeſus, Conſtantine.

MONOLOGUE, in poetry, a dramatic ſcene, in which a perſon appears alone on the ſtage, and ſpeaks to himſelf.

MONOMIAL, in algebra, a root or quantity that has but one name, or conſiſts of only one member, as *a b*, *a a b*, &c. See ROOT, QUANTITY, BINOMIAL, &c.

MONOMOTOPA, a country of Africa, bounded by Monemugi on the north, and by Cafraria on the eaſt, ſouth, and weſt.

MONOPETALOUS, in botany, a term applied to flowers that have only one petal, or flower-leaf.

MONOPOLI, a town in the kingdom of Naples, ſituated on the gulph of Venice: eaſt long. 18°, and north lat. 41° 5′.

MONOPOLY, one or more perſons making themſelves the ſole maſters of the whole of a commodity, manufacture, and the like, in order to make private advantage of it, by ſelling it again at a very advanced price. A monopoly is alſo an allowance of the king, by grant, or otherwiſe, for the ſole dealing in any thing, by which others are reſtrained from any freedom they had before.

Monopolies are againſt the antient fundamental laws of this kingdom; and it is held, that the making uſe of, or procuring any unlawful monopoly, is puniſhable at common law, by fine and impriſonment. By ſtatute, all monopolies, grants, &c. for the ſole buying, ſelling, or making of goods and manufactures are declared void; and the perſon injured thereby, may recover treble damages and double coſts, by action on the ſtatute: but this act does not extend to any privilege granted by parliament; nor to companies or ſocieties of merchants, or corporations, &c. neither to any grant for printing, or to inventors of new manufactures, who have patents for the term of fourteen years.

MONOPTERE, in architecture, a kind of temple, round, and without walls, having a dome ſupported by columns.

MONOPTOTON, in grammar, a noun that has only one caſe, as *inficias*.

MONOPYRENEOUS, in botany, ſuch fruit as contains only one ſeed, or kernel.

MONORHYME, a piece of poetry, in which all the verſes end with the ſame rhyme.

MONOSTICH, an epigram that conſiſts of only one ſingle verſe. See the article EPIGRAM.

MONOSYLLABLE, in grammar, a word that conſiſts of only one ſyllable, and is compoſed of either one or more letters pronounced at the ſame time.

The too frequent uſe of monoſyllables, has a very bad effect in Engliſh poetry, as Mr. Pope both intimates and exemplifies in the ſame verſe, *viz.*

"And ten ſlow words oft creep in one dull line."

MONOTHELITES, a ſect of Chriſtians in the VIIth century, ſo called from their maintaining, that though there were two natures in Jeſus Chriſt, the human and divine, there was but one will, which was the divine.

MONOTONY, an uniformity of ſound, or a fault in pronunciation, when a long ſeries of words are delivered in one unvaried tone.

MONOTROPA, in botany, a genus of the decandria-monogynia claſs of plants, the flower of which conſiſts of ten oblong deciduous petals, ſerrated at the tops: the fruit is an oval, pentagonal, obtuſe capſule, containing a great number of paleaceous ſeeds.

This genus comprehends the orobanchoides of Tournefort, and the hypopitys of Dillenius.

MONS, the capital of the province of Hainalt, in the auſtrian Netherlands: ſituated twenty-ſix miles ſouth-weſt of Bruſſels: eaſt long. 3° 33′, and ſouth lat. 50° 34′.

MONSARAZ, a town of Portugal, in the province of Alentejo: weſt long. 8°, and north lat. 38° 30′.

MONSEIGNEUR, MY LORD, a title of honour uſed by the French, in writing or ſpeaking to dukes, peers, archbiſhops, biſhops, and preſidents à mortier. Monſeigneur abſolutely uſed, is a title now reſtrained to the dauphin of France;

thus it is ſaid, an officer belonging to monſeigneur: but this cuſtom was not introduced till the reign of Lewis XIV. the dauphin before that time being called monſieur le dauphin.

MONSIEUR, a title of civility uſed by the French, in ſpeaking to, or of their equals, or thoſe that are but a little below them: thus a duke or a marquis, when ſpeaking to an equal or inferior, uſes the word monſieur; and a mechanic ſpeaking to a mechanic, gives him the ſame title: but no body calls the french king monſieur, except the children of France.

In France the inſcriptions of all letters run thus; *A monſieur monſieur* ſuch a one.

Monſieur, abſolutely uſed, is a title given to the ſecond ſon of France, and to the king's brother.

MONSOON, in phyſiology, a ſpecies of trade-wind, in the Eaſt-Indies, which for ſix months blows conſtantly the ſame way, and the contrary way the other ſix months. See the article WIND.

However, it ought to be obſerved, that the points of the compaſs from whence the monſoons blow, as well as the times of their ſhifting, differ in different parts of the Indian ocean.

The cauſe of monſoons is this: when the ſun approaches the northern tropic, there are countries, as Arabia, Perſia, India, *&c.* which become hotter, and reflect more heat than the ſeas beyond the equator, which the ſun has left; the winds, therefore, inſtead of blowing from thence, to the parts under the equator, blow the contrary way; and, when the ſun leaves thoſe countries, and draws near the other tropic, the winds turn about, and blow on the oppoſite point of the compaſs.

MONSTER, *monſtrum*, in general, denotes any production that deviates from the ſpecies to which it belongs, whether with reſpect to the number or diſpoſition of its parts; in which ſenſe, a man with ſix fingers on each hand, or ſix toes on each foot, is a monſter. But the term monſter ſeems to be chiefly applied to ſuch productions as deviate very much from the ordinary courſe of nature.

MONSTIERS, or MOUSTIERS, a city of Savoy, thirty miles ſouth-eaſt of Chamberry.

MONSTRANS DE DROIT, in law, is a writ which iſſues out of the court of chancery, for reſtoring a perſon to lands or tenements, that are his in right.

MONSTRANS DE FAIT, in law, is producing the deeds in open court, when an action is brought upon any deed.

MONSTRAVERUNT, in law, is a writ in behalf of a tenant that holds lands by free-charter in antient demeſne, on his being diſtrained for the payment of any ſervice or impoſition, contrary to the liberty he does or ought to enjoy. It alſo lies where a tenant is unjuſtly diſtrained for the payment of toll.

A writ of monſtraverunt may be iſſued out by any number of tenants, without naming any of them by their proper names, but only in general, the men of ſuch a place.

MONT-ALTO, a town of Italy, in the pope's territories, and marquiſate of Ancona, twenty-three miles ſouth of Loretto.

MONT ST. ANDRE, a town of the Auſtrian Netherlands, in the province of Brabant, eleven miles north of Namur.

MONTARGIS, a city of France, in the province of Orleanois, fifty miles ſouth of Paris.

MONTAUBAN, a city of France in the province of Guienne, eighteen miles north of Toloufe.

MONTBELLIARD, a city of France, in the province of Franche-comte, thirty-five miles north-eaſt of Beſançon.

MONTE SANCTO, or MOUNT-ATHOS, a mountain of European Turky, in the province of Macedon: eaſt long. 23°, and north lat. 40° 12′.

It is called Monte Sancto, or Holy Mountain, from twenty-two monaſteries ſituated upon it, in which are four thouſand monks or friars, who never ſuffer a woman to come within ſight of their convent.

MONTFERRAT, a dutchy in Italy bounded by the lordſhip of Verceil on the north, by the Alexandrin on the eaſt, by the territory of Genoa on the ſouth, and by the county of Aſti on the weſt. The chief town is Caſal.

MONTFORT, the capital of the county of Montfort, in the circle of Swabia, in Germany: eaſt long. 9° 40′, and north lat. 47° 15′.

MONTGOMERY, the capital of Montgomeryſhire, in Wales, ſituated on the river Severn, twenty miles ſouth-weſt of Shrewſbury.

MONTH, *menſis*, in chronology, the twelfth part of a year. See the article YEAR.

Time being duration, marked out for certain uſes, and meaſured by the motion

tion of the heavenly bodies, there thence reſults divers kinds of months as well as years, different from one another according to the particular luminary by whoſe revolution they are determined, and the particular purpoſes they are deſtined for: hence months are of two kinds, aſtronomical and civil.

An aſtronomical month is that which is governed either by the motion of the ſun or moon, and is conſequently of two kinds, ſolar and lunar: a ſolar month is that time, in which the ſun ſeems to run through a whole ſign, or the twelfth part of the ecliptic.

Hence, if regard be had to the ſun's true apparent motion, the ſolar month will be unequal, ſince the ſun is longer in paſſing through the winter-ſigns than through thoſe of the ſummer; but as he conſtantly travels through all the twelve ſigns in 365 days, 5 hours, and 49 minutes, the quantity of a mean month will be had, by dividing that number by 12; on this principle, the quantity of a ſolar month will be found to be 30 days, 10 hours, 29 minutes, 5 ſeconds. See EARTH.

A lunar month is that ſpace of time which the moon takes up in performing its courſe through the zodiac, or that meaſured by the motion of the moon round the earth; and is of three kinds, *viz.* periodical, ſynodical, and that of illumination. The lunar periodical month, is the ſpace of time wherein the moon makes her round through the zodiac, or wherein ſhe returns to the ſame point, being 27 days, 7 hours, 43 minutes, 5 ſeconds. See the article MOON.

The lunar ſynodical month, called alſo abſolutely the lunar month and lunation, is the ſpace of time between two conjunctions of the moon with the ſun; or the time it takes from one conjunction with the ſun to the next; or from one new moon to another: the quantity of a ſynodical month is 29 days, 12 hours, 44 minutes, 3 ſeconds, and 11 thirds. The quantity of a ſynodical month is not the ſame at all times, for in the ſummer ſolſtice, when the ſun ſeems to move ſloweſt, the ſynodical month appeareth leſs, being about 29 days, 6 hours, 42 minutes; but in the winter, when the ſun's motion ſeems faſter, the moon does not fetch up the ſun ſo ſoon, for which reaſon the ſynodical month then ſeems greater, *viz.* 29 days, 19 hours, and 37 minutes, according to the obſervation of the ſame aſtronomers: ſo that the firſt quantity given of the ſynodical month, is to be underſtood as to the mean motion. From what has been ſaid, it may eaſily appear that the difference between a periodical and ſynodical month is this; the firſt is called periodical in reſpect of the moon's orbit; but the ſynodical is ſo called in reſpect of its connection with the other luminary. Now after the time of its conjunction, the ſun does not continue in the ſame place of the zodiac, but moves forwards towards the eaſt, upon which it falls out that the moon, finiſhing its courſe, does not find the ſun again in the ſame place where it left him, he being removed almoſt a whole ſign from his former place, ſo that to overtake the ſun again, it plainly appears that a certain ſpace of time is requiſite beſides the periodical, which makes up the ſynodical month.

The antient Romans made uſe of the lunar months, and made them alternately of 29 and 30 days; and they marked the days of each month by three terms, *viz.* calends, nones, and ides. See the articles CALENDS, *&c.*

The lunar month of illumination, or appoſition, or illuminative month, is the ſpace from the firſt time of the moon's appearance after new moon, to her firſt appearance after the new moon following. The lunar month of illumination is not of any determined quantity, becauſe the moon appears ſometimes ſooner, and ſometimes later, after the conjunction; for which diverſity aſtronomers give us ſeveral reaſons, particularly the obliquity of the zodiac, the variable latitude of the moon, the apparent inequality of its motion, the different qualities of the ſummer and winter-air, *&c.* By this month, however, the Turks and Arabs go; and it is ſaid that the antient Britons went by the phaſes of the moon.

A civil or political month, conſiſts of a certain number of days according to the laws and cuſtoms of the different countries wherein it is uſed, either having no regard to the ſolar or lunar months, as thoſe of the Egyptians in their equal year, of the Romans in the year of Romulus, *&c.* or coming pretty near to the ſolar aſtronomical month, as the julian; or elſe the lunar aſtronomical, as the jewiſh, turkiſh, and others. The britiſh and moſt european nations make 12 months in the year, *viz.* January, February, *&c.* See the articles JANUARY, *&c.*

Civil ſolar months, are ſuch civil months as are accommodated to the aſtronomical months,

months, or those which are to consist alternately of 30 and 31 days, excepting one month of the twelve, which, for every fourth year, consisted of 30 days, and for the other years of 29. This form of civil months was introduced by Julius Cæsar; but under Augustus the sixth month, till then, from its place, called Sextilis, was denominated Augustus, in honour of that prince; and to make the compliment yet the greater, a day was added to it, so that it now consists of 31 days, though till then it had only 30: to make up for which, a day was taken from February, so that from thenceforward it only consisted of 28 days, and every fourth year of 29; though before it had ordinarily consisted of 29 days, &c. and such are the civil or calendar months which now obtain throughout Europe.

Civil lunar months are to consist alternately of 29 and 30 days: thus will two civil months be equal to two astronomical ones, abating for the odd minutes, and consequently the new moon will be hereby kept to the first day of each such civil month, for a long time together. However, to make them keep constantly pace with the civil months, at the end of each 948 months, a month of 29 days must be added; or else every 33d month must consist of 30 days. This was the month in civil or common use among the Jews, Greeks, and Romans, till the time of Julius Cæsar.

Philosophical MONTH, among chemists, is the space of 40 days and nights.

MONTIA, BLINKS, in the linnæan system of botany, a genus of the triandria-trigynia class of plants, the corolla whereof consists of a single petal, and is divided at the extremity into five parts; three of the segments are smaller than the others, and produce stamina; these stand alternately with the two larger: the fruit is a turbinated obtuse capsule, covered by the cup, composed of three valves, and having three cells; the seeds are three in number and roundish.

MONTIFRINGILLA, the BRAMBLING, in zoology, a species of the fringilla, with the base of the wings a gold-yellow underneath. See FRINGILLA.

MONTMARIANO, a town of Italy, in the kingdom of Naples and further Principate, situated thirty-five miles east of Naples.

MONTMEDY, a town of the Austrian Netherlands, in the province of Luxemburg, situated twenty miles west of Luxemburg.

MONTMELIAN, a fortress in the dutchy of Savoy, situated on the frontiers of Dauphiné, ten miles south of Chamberry.

MONTPAGNOTE, or POST *of the invulnerable*, in the military art, an eminence chosen out of the reach of the cannon of a place besieged, where curious persons post themselves, to see an attack, and the manner of the siege, without being exposed to any danger.

MONTPELIER, a city of France, in the province of Languedoc and county of Nismes, situated on the little river Lez, fifty miles north east of Narbonne, and forty-five miles south-west of Avignon; a place famous for its delightful situation, its healthy serene air, and medical compositions.

MONTREAL, a city of Sicily, in the province of Mazara, situated near the sea, five miles east of Palermo.

MONTREAL is also a town of Canada, in North America, situated on the river of St. Laurence, one hundred miles south of Quebec.

MONTREVIL, a town of France, thirty miles south of Calais.

MONTROSE, a town of North Britain, in the shire of Angus, situated at the mouth of the river Esk, on the German ocean, forty-six miles north-east of Edinburgh.

Steel-spaws are very numerous in the country about Montrose; besides these there is a well near this town, whose water is of a whitish colour, soft taste, and faintly discovering a mineral quality, and is of a different nature from the steel ones. It is universally diuretic, and has been found useful in stranguries, stoppage of urine, scorbutic disorders, flatulencies, &c.

MONTROYAL, or MONTREAL, a fortress of Germany, in the circle of the lower Rhine and electorate of Triers, situated twenty miles north-east of Triers.

MONTSERAT, a mountain of Spain, in the province of Catalonia, twenty-one miles north-west of Barcelona, where there is a monastery and chapel dedicated to the Virgin Mary, to which there is a great resort of pilgrims.

MONTSERAT is also one of the smaller of the Caribbee-islands, subject to Great Britain: it is situated about thirty miles south-west of Antigua.

MONUMENT, in architecture, a building destined to preserve the memory, &c. of

the perſon who raiſed it, or for whom it was raiſed; ſuch are a triumphal arch, a mauſoleum, a pyramid, *&c.* The firſt monuments that were erected by the antients, were of ſtones, which were laid over tombs, on which were cut the names and actions of the deceaſed. Theſe ſtones were diſtinguiſhed by various names, according as their figures were different: the Greeks called thoſe which were ſquare at the baſe, and were the ſame depth throughout their whole length, ſteles; from whence our ſquare pillaſters, or attic columns, are derived: thoſe which were round in their baſe, and ended in a point at top, they called ſtyles; which gave occaſion to the invention of diminiſhed columns: thoſe which were ſquare at the foot, and terminated in a point at the top, in the manner of a funeral pile, they called pyramids: to thoſe whoſe baſes were more in length than in breadth, and which roſe ſtill leſſening to a very great height, reſembling the figure of the ſpits or inſtruments uſed by the antients in roaſting the fleſh of their ſacrifices, they called obeliſks. See OBELISKS, *&c.*

MONUMENT, abſolutely ſo called among us, is a magnificent pillar, erected by order of parliament, in memory of the burning of the city of London, *anno* 1666, in the very place where the fire began. This pillar is of ſtone, of the doric order, and fluted. It is one of the boldeſt pieces of architecture that ever was attempted, being 202 feet high, and the diameter 15; it ſtands on a pedeſtal 40 feet high, and 21 feet ſquare, the front being enriched with curious emblems in baſſo relievo: within are winding ſtairs, up to the very top.

MONYCHA, among naturaliſts, an appellation given to animals with ſingle or undivided hoofs. See the article HOOF.

MOOD, or MODE, in logic, called alſo ſyllogiſtic mood, a proper diſpoſition of the ſeveral propoſitions of a ſyllogiſm, in reſpect of quantity and quality. See the articles SYLLOGISM, QUANTITY, and QUALITY.

As in all the ſeveral diſpoſitions of the middle term, the propoſitions of which a ſyllogiſm conſiſts, may be either univerſal or particular, affirmative or negative; the due determination of theſe, and putting them together as the laws of argumentation require, conſtitute what logicians call the moods of ſyllogiſms. Of theſe moods there are a determinate number to every figure, including all the poſſible ways in which propoſitions, differing in quantity or quality, can be combined, according to any diſpoſition of the middle term, in order to arrive at a juſt concluſion. There are two kinds of moods, the one direct, the other indirect.

The direct mood is that wherein the concluſion is drawn from the premiſes directly and immediately, as, "Every animal "is a living thing, every man is a living "animal; therefore, every man is a liv-"ing thing." There are fourteen of theſe direct moods, four whereof belong to the firſt figure, four to the ſecond, and ſix to the third. They are denoted by ſo many artificial words framed for that purpoſe, *viz.* 1. Barbara, celarent, darii, ferioque. 4. Baralip, celantes, dabitis, fapeſmo, friſeſom. 2. Ceſare, cameſtres, feſtino, baroco. 3. Darapti, ſelapton, diſamis, datiſi, bocardo, feriſon. The uſe and effect of which words lie wholly in the ſyllables, and the letters whereof the ſyllables conſiſt; each word, for inſtance, conſiſts of three ſyllables, denoting the three propoſitions of a ſyllogiſm, *viz.* major, minor, and concluſion: add, that the letters of each ſyllable are either vowels or conſonants; the vowels are A, which denotes an univerſal affirmative; E, an univerſal negative; I, a particular affirmative; and O, a particular negative: thus Barbara is a ſyllogiſm or mood of the firſt figure, conſiſting of three univerſal affirmative propoſitions: Baralip, one of the fourth figure, conſiſting of two univerſal affirmative premiſes, and a particular affirmative concluſion. The conſonants are chiefly of uſe in the reduction of ſyllogiſms. See FIGURE and REDUCTION.

The indirect mood, is that wherein the concluſion is not inferred immediately from the premiſes, but follows from them by means of a converſion; as, "Every "animal is a living thing, every man is "an animal; therefore ſome living thing "is a man."

MOOD, or MODE, in grammar, the different manner of conjugating verbs, ſerving to denote the different affections of the mind. See the article VERB.

Hence ariſe four moods, *viz.* the indicative, ſubjunctive, and imperative: of theſe the three firſt are called finite moods, becauſe they define a certain perſon and number; but the fourth is called the infinitive, becauſe in it there is no diſtinction of either perſon or number. See the article INDICATIVE, *&c.*

Some grammarians reckon five moods, *viz.*

viz. the indicative, ſubjunctive, optative, imperative, and infinitive; and ſome make ſix, dividing the optative into potential and optative. See the articles OPTATIVE and POTENTIAL.

The Greeks have five moods, differing in termination; but the Latins have only four. The engliſh terminations are the ſame in all the moods.

MOOD, or MODE, in philoſophy, and in muſic. See the article MODE.

MOON, *luna*, ☽, in aſtronomy, a ſatellite, or ſecondary planet, always attendant on our earth.

Of the ſix primary planets, we find but three that are certainly attended with moons, *viz.* the earth, jupiter, and ſaturn; for though Mr. Short has given an account of a phænomenon that he obſerved ſome years ago, which ſeems extremely like a moon about venus, yet, as it was never obſerved before nor ſince, through the beſt of teleſcopes, it does not appear to be a moon. See the articles JUPITER, EARTH, and SATURN.

Aſtronomers have drawn the face of the moon, according as it is ſeen with the beſt teleſcopes; for which we are obliged to the accurate labours of the famous ſelenographers Florentius, Langrenus, John Hevelius of Dantzic, Grimaldus and Ricciolus, Italians; who have taken particular care to note all the ſhining parts of the moon's face, and, for the better diſtinguiſhing them, they have given to each part a proper name. Langrenus and Ricciolus have divided the lunar regions among the philoſophers and aſtronomers, and other eminent men; but Hevelius fearing leſt the philoſophers ſhould quarrel about the diviſions of the lands, has ſpoiled them of this their property, and given the parts of the moon thoſe geographical names that belong to the different iſlands, countries, and ſeas of our earth, without any regard to their ſituation or figure. See plate CLXXXII. fig. 1.

That the ſurface of the moon is not ſmooth or even, but diverſified with hills and vales, continents and ſeas, lakes, &c. any one would imagine, who views her face through a large teleſcope. That ſhe has variety of hills and mountains is demonſtrable from the line which bounds the light and dark parts not being an even regular curve, as it would be upon a ſmooth ſpherical ſurface, but an irregular broken line, full of dents and notches, as repreſented, *ibid.* fig. 2.

Alſo becauſe ſome ſmall (and many large) bright ſpots appear in the dark portion, ſtanding out at ſeveral diſtances from the boundary line; which ſpots in a few hours become larger, and at laſt unite with the enlightened portion of the diſk. For the method of meaſuring theſe lunar mountains, ſee MOUNTAIN.

On the other hand, we obſerve many ſmall ſpots interſperſed all over the bright part, ſome of which have their dark ſides next the ſun, and their oppoſite ſides very bright and circular, which infallibly proves them to be deep, hollow round cavities; of which there are two very remarkable ones near together on the upper part, and may be viewed exceedingly plain, when the moon is about four or five days old. The depth of theſe lunar cavities prodigiouſly exceeds the height of the mountains, and conſequently the ſurface of the moon has but little reſemblance to that of the earth in theſe reſpects.

Since, then, the moon's ſurface appears to be ſo very mountainous and irregular, it has been a queſtion, how it comes to paſs that the bright circular limb of the diſk does not appear jagged and irregular, as well as the curve bounding the light and dark parts: in anſwer to this, it muſt be conſidered, that, if the ſurface of the moon had but one row of mountains placed round the limb of the diſk, the ſaid bright limb would then appear irregularly indented; but ſince the ſurface is all over mountainous, and ſince the viſible limb is to be conſidered not as a ſingle curve line, but a large zone, having many mountains one behind another, from the obſerver's eye, it is evident the mountains in ſome rows being oppoſite to the vales in others, will fill up the inequalities in the viſible limb in the remoter parts, which diminiſh to the ſight and blend with each other, ſo as to conſtitute, like the waves of the ſea, one uniform and even horizon. Whether there be ſeas, lakes, &c. in the moon, has been a queſtion long debated, but now concluded in the negative: for in thoſe large darker regions, which were thought to be ſeas, we view, through a good teleſcope, many permanent bright ſpots, as alſo caverns and empty pits, whoſe ſhadows fall within them, which can never be ſeen in ſeas or any liquid ſubſtance. Their dark and duſky colour may proceed from a kind of matter or ſoil, which reflects light leſs than that of the other regions. Theſe

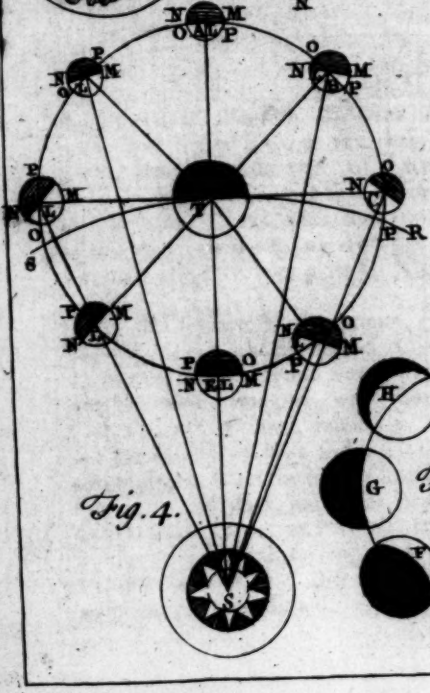
ſpots

BRITISH MUSEUM

Fig. 1.

Fig. 2

Fig. 3.


N M
O L P
P
N M
O
N M
O L P
P
N M
O
P
N M
O
P
N M
O
P
N M
O L P
P
N M
O
P
N M
O L P
P
N M
O
P
N M
O L P

ſpots have continued always the ſame unchangeably, ſince they were firſt viewed with a teleſcope; though leſs alterations than what happen in the earth, in every ſeaſon of the year, by verdure, ſnow, inundations, and the like, would have cauſed a change in their appearance. But indeed as there are no ſeas nor rivers in the moon, and no atmoſphere, ſo of courſe there can be no clouds, rain, ſnow, or other meteors, whence ſuch changes might be expected.

Sir Iſaac Newton mentions an atmoſphere about the moon, but other aſtronomers think there is reaſon (not to ſay a demonſtration) for the contrary: for were there an atmoſphere of air like ours, it muſt neceſſarily obſcure the fixed ſtars in the moon's appulſe to them; but it has been obſerved that this never happens: on the contrary, they preſerve all their ſplendor to the moment of their occultation, and then diſappear inſtantaneouſly, and in the ſame manner they recover their light, when they appear again on the other ſide.

The diſtance of our moon from the earth is determined by her horizontal parallax, or the angle which the ſemidiameter of the earth ſubtends at the moon, *viz.* the angle A O C (*ibid.* fig. 3.) which is the difference between the true place of the moon's center O, when in the horizon, and the apparent place thereof, as viewed from the ſurface of the earth at A. The former is known by aſtronomical tables, the latter by obſervation: and the quantity of this difference, or angle, at a mean, is 57′ 12″ = A O C.

If therefore we ſay, as the tangent of 57′ 12″ is to radius, ſo is A C = 1 to C O = 60,1; this will be the mean diſtance of the moon in ſemidiameters of the earth. Therefore, ſince one ſemidiameter of the earth contains 3982 miles, we have 3982 × 60,1 = 239318,2 = C O the mean diſtance of the moon.

The moon's apparent ſemidiameter M O meaſures, at her mean diſtance, 15′ 38″ = 938″ by the micrometer, which is the quantity of the angle M C O. The earth's diameter, therefore, is to the moon's, as 3432″ to 938; that is, as 109 to 30, or as 3,63 to 1. Wherefore $\frac{30}{109} \times 7964 =$ 2192 miles the moon's diameter.

Therefore the face of the earth, as it appears to the lunarians, is to the face of the moon, as it appears to us, as 109 × 109 to 30 × 30, *viz.* as 11881 to 900, or as 12,2 to 1. And the real bulk of the earth is to that of the moon as 109 × 109 × 109 to 30 × 30 × 30, *viz.* as 1295029 to 27000, that is, as 1295 to 27, or as 48 to 1 very nearly.

Since, as we have ſhewn, the mean diſtance of the moon is about 60 ſemidiameters of the earth, at the diſtance of the moon one degree of the earth's ſurface will ſubtend an angle of one minute, and will therefore be viſible; but ſuch a degree is equal to 69½ miles; therefore a ſpot or place 70 miles in diameter, in the moon, will be juſt viſible to the naked eye. Hence a teleſcope that magnifies about 100 times, will juſt diſcover a ſpot whoſe diameter is $\frac{1}{100}$ of 70 miles, or $\frac{7}{10}$ of a mile, of 3698 feet: and a teleſcope that will magnify 1000 times, will ſhew an object that is but $\frac{7}{100}$ of a mile, that is, whoſe diameter is but 370 feet, or little more than 120 yards; and therefore will eaſily ſhew a ſmall town or village, or even a gentleman's ſeat, if any ſuch there be.

The time which the moon takes up in making one revolution about the earth, from a fixed ſtar to the ſame again, is 27d. 7h. 43′, which is called the periodical month. But the time that paſſes between two conjunctions, that is, from one new moon to another, is equal to 29 d. 12 h. 44′ 3″, which is called a ſynodical month: for, after one revolution is finiſhed, the moon has a ſmall arch to deſcribe to get between the ſun and the earth, becauſe the ſun keeps advancing forward in the ecliptic. Now this ſurplus of motion takes up 2 d. 5 h. 1′ 3″, which added to the periodical month makes the ſynodical, according to the mean motions.

The moon moves about its own axis in the ſame time that it moves about the earth, from whence it comes to paſs that ſhe always ſhews the ſame face to us: for by this motion about her axis, juſt ſo much of her ſurface is turned towards us conſtantly, as by her motion about the earth would be turned from us.

But ſince this motion about the axis is equable and uniform, and that about the earth, or common center of gravity, is unequal and irregular, as being performed in an ellipſis, it muſt follow that the ſame part of the moon's ſurface, preciſely, can never be ſhewn conſtantly to the earth; and this is confirmed by the teleſcope, through which we often obſerve a little gore or ſegment on the eaſtern and

weſtern limb appear and diſappear by turns, as if her body librated to and fro; which therefore occaſioned this phænomenon to be called the moon's libration. The orbit of the moon is elliptical, more ſo than any of the planets, and is perpetually changing or variable, both in reſpect of its figure and ſituation; of which we ſhall treat more largely further on. The inclination of the moon's orbit to the plane of the ecliptic is alſo variable, from 5° to 5° 18'. The line of the nodes likewiſe has a variable motion from eaſt to weſt, contrary to the order of the ſigns, and completes an entire revolution in a ſpace of time a little leſs than nineteen years. Alſo the line of the apſides, or of the apogee and perigee, has a direct motion from weſt to eaſt, and finiſhes a revolution in the ſpace of about nineteen years. All which will be more copiouſly treated of, when we come to explain the phyſical cauſes thereof.

The phaſes of the moon in every part of the orbit, are eaſily accounted for from her different ſituation with reſpect to the earth and ſun: for, though to an eye placed in the ſun ſhe will always exhibit a compleat illuminated hemiſphere; yet in reſpect to the earth, where the hemiſphere is viewed in all degrees of obliquity, it will appear in every degree from the greateſt to the leaſt; ſo that at E, (plate CLXXXII. fig. 4, and 5.) no part at all of the enlightened ſurface can be ſeen. At D, a little part of it is turned towards the earth, and from its figure it is then ſaid to be horned. At C, one half of the enlightened ſurface is turned to the earth, and ſhe is then ſaid to be dichotomiſed, and in her firſt quarter or quadrature. At B, a part more than half is turned to the earth, and then ſhe is ſaid to be gibbous. At A, her whole illuminated hemiſphere is ſeen, being then in oppoſition to the ſun; and this is called the full moon. At H, ſhe is again gibbous, but on the other part; at G ſhe is again dichotomiſed, and in her laſt quarter; at F ſhe is horned, as before; and then becomes new again at E, where ſhe is in conjunction with the ſun.

If MN be drawn perpendicular to the line SL joining the centers of the ſun and moon, and OP perpendicular to the line TL joining the centers of the earth and moon, it is evident that the angle PLN in the firſt half of the orbit, and OLM in the ſecond, will be proportional to the quantity of the illuminated diſk turned towards the earth; and this angle is every where equal to the angle ETL, which is called the elongation of the moon from the ſun.

To find what quantity of the moon's viſible ſurface is illuſtrated for any given time, we are to conſider that the circle of ilumination BFC, (*ibid.* fig. 6.) is oblique to the view every where, but at E and A; and therefore by the laws of the orthographic projection, it will be projected into an ellipſe whoſe longeſt axis is the diameter of the moon BC, and the ſemi-conjugate is FL = coſine of the angle of elongation FBP. Hence FP = verſed ſine of the ſaid angle. But from the nature of the circle and ellipſe, we have LP in a conſtant ratio to FP, wherever the line QP is drawn perpendicular to B; therefore alſo 2LP = PQ has a conſtant ratio to FP. But (by Euclid V. 12.) the ſum of all the lines QP = area of the circle is to the ſum of all the lines FP = area of the illuminated part, as the diameter of the circle QP to the verſed ſine of the elongation FP.

As the moon illuminates the earth by a reflex light, ſo does the earth the moon; but the other phænomena will be different for the moſt part. 1. The earth will be viſible but to little more than one half of the lunar inhabitants. 2. To thoſe who ſee it, the earth appears fixed, or at leaſt to have no circular motion, but only that which reſults from the moon's libration. 3. Thoſe who live in the middle of the moon's viſible hemiſphere, ſee the earth directly over their heads. 4. To thoſe who live in the extremity of that hemiſphere, the earth ſeems always nearly in the horizon, but not exactly there, by reaſon of the libration. 5. The earth, in the circle of a month, would have all the ſame phaſes as the moon has. Thus the lunarians, when the moon is at E, in the middle of their night, ſee the earth at full, or ſhining with a full face; at C and G it is dichotomiſed, or half light and half dark; at A it is wholly dark, or new; and at the parts between theſe it is gibbous. 6. The earth appears variegated with ſpots of different magnitudes and colours, ariſing from the continents, iſlands, oceans, ſeas, clouds, &c. 7. Theſe ſpots will appear conſtantly revolving about the earth's axis, by which the lunarians will determine the earth's diurna

diurnal rotation, in the ſame manner as we do that of the ſun.

Theory of the MOON's *motion.* As the moon is the neareſt to us in the ſolar ſyſtem, and as great advantages may be deduced from her motions, we ſhall be the fuller on this ſubject. If then the ſun acted equally on the earth and moon, and always in parallel lines, this action would only ſerve to reſtrain them in their annual motions round the ſun, and no way affect their action on each other, or their motions about the common center of gravity. But becauſe the moon is nearer the ſun in one half of her orbit than the earth is, and at a greater diſtance in the other half, and the power of gravity being always greater at a leſs diſtance, it follows, that, in one half of her orbit, the moon is more attracted than the earth towards the ſun, and in the other half leſs attracted; and hence irregularities neceſſarily ariſe in the motion of the moon, the exceſs in the firſt caſe, and the defect in the ſecond, becoming a force that diſturbs her motion: add to this, that the action of the ſun on the earth and moon is not directed in parallel lines, but in lines that meet at the center of the ſun. Suppoſe the moon ſetting out from the quarter that precedes the conjunction, with a velocity that would make her deſcribe an exact circle round the earth, if the ſun's action had no effect on her; and becauſe her gravity is increaſed by that action, ſhe muſt deſcend towards the earth, and move within that circle: her orbit there, will be more curve than otherwiſe it would have been; becauſe this addition to her gravity will make her fall farther at the end of an arc below the tangent drawn at the other end of it; her motion will be accelerated by it, and will continue to be accelerated till ſhe arrives at the enſuing conjunction; becauſe the direction of the action of the ſun upon her, during that time, makes an acute angle with the direction of her motion. At the conjunction, her gravity towards the earth being diminiſhed by the action of the ſun, her orbit will be leſs curve there for that reaſon; and ſhe will be carried farther from the earth as ſhe moves to the next quarter; and, becauſe the action of the ſun makes then an obtuſe angle with the direction of her motion, ſhe will be retarded by the ſame degrees by which ſhe was accelerated before.

Thus ſhe will deſcend a little towards the earth, as ſhe moves from the firſt quarter towards the conjunction, and aſcend from it, as ſhe moves from the conjunction to the next quarter. The action which diſturbs her motion will have a like and almoſt equal effect upon her, while ſhe moves in the other half of her orbit, or that half of it which is fartheſt from the ſun: ſhe will proceed from the quarter that follows the conjunction with an accelerated motion to the oppoſition, approaching a little towards the earth, becauſe of the addition made to her gravity, at that quarter, from the action of the ſun; and receding from it again, as ſhe goes on from the oppoſition to the quarter from which we ſuppoſed her to ſet out. The areas deſcribed in equal times by a ray drawn from the moon to the earth will not be equal, but will be accelerated by the conſpiring action of the ſun, as ſhe moves towards the conjunction or oppoſition from the quarters that precede them; and will be retarded by the ſame action, as ſhe moves from the conjunction or oppoſition to the quarters that ſucceed them.

Sir Iſaac Newton has computed the quantities of theſe irregularities from their cauſes. He finds, that the force added to the gravity of the moon in her quarters, is to the gravity with which ſhe would revolve in a circle about the earth, at her preſent mean diſtance, if the ſun had no effect on her, as 1 to $178\frac{29}{32}$. He finds the force ſubducted from her gravity, in the conjunctions and oppoſitions, to be double of this quantity, and the area deſcribed in a given time in the quarters, to be to the area deſcribed in the ſame time in the conjunctions and oppoſitions, as 10973 to 11073. He finds, that, in ſuch an orbit, her diſtance from the earth in her quarters, would be to her diſtance in the conjunctions and oppoſitions, as 70 to 69.

From the ſame principle of gravitation, may the retrograde motion of the nodes be accounted for. See NODE.

The quantity of this retrograde motion is found by computation to be 19° 18′ 1″ in a year, and the aſtronomical tables make it only 19° 21′ 21″; ſo that the theory agrees nearly with obſervation.

The action of the ſun diminiſhes the gravity of the moon towards the earth, in the conjunctions and oppoſitions, more than it adds to it in the quarters, and, by diminiſhing the force which retains the moon in her orbit, it increaſes her

diſtance from the earth and her periodic time: and becauſe the earth and moon are nearer the ſun in their perihelium than in their aphelium, and the ſun acts with a greater force there, ſo as to ſubduct more from the moon's gravity towards the earth; it follows, that the moon muſt revolve at a greater diſtance, and take a longer time to finiſh her revolution in the perihelium of the earth, than in the aphelium; and this alſo is conformable to obſervation.

There is another remarkable irregularity in the moon's motion, which alſo ariſes from the action of the ſun, *viz.* the progreſſive motion of the apſides. In the quarters, the ſun's action adds to the gravity of the moon, and the force it adds is greater, as the diſtance of the moon from the earth is greater; ſo that the action of the ſun hinders her gravity towards the earth, from decreaſing as much while the diſtance increaſes, as it ought to do according to the regular courſe of gravity; and therefore, while the moon is in the quarters, her apſides muſt recede. In the conjunction and oppoſition, the action of the ſun ſubducts from the gravity of the moon towards the earth, and ſubducts the more the greater her diſtance from the earth is, ſo as to make her gravity decreaſe more as her diſtance increaſes, than according to the regular courſe of gravity; and therefore, in this caſe, the apſides are in a progreſſive motion. Becauſe the action of the ſun ſubducts more in the conjunctions and oppoſitions from her gravity, than it adds to it in the quarters, and, in general, diminiſhes more than it augments her gravity; hence it is that the progreſſive motion of the apſides exceeds the retrograde motion; and therefore, the apſides are carried round according to the order of the ſigns.

Thus the various irregularities of the moon's motion are explained from gravity; and from this theory, with the aſſiſtance of a long ſeries of accurate obſervations, her motion may be at length reduced ſo exactly to computation, and her appulſes to the fixed ſtars, over which ſhe paſſes in her courſe, may be predicted with ſo much accuracy, as to afford, on many occaſions, an opportunity to navigators to diſcover their longitude at ſea.

From this theory, what by all aſtronomers was thought moſt difficult, and even impoſſible to be done, the incomparable Sir Iſaac Newton has effected, *viz.* To determine by calculation the moon's place, even in her quadratures, and all other parts of her orbit, beſides the ſyzygies; and that ſo accurately, that the difference between that and her true place in the heavens, ſhall ſcarce be two minutes.

In 20 julian years, or 7305 days, the ſun's mean motion was found to be 20 revolutions, 9 minutes, 4 ſeconds: and the motion of the ſun's apogee, 21 minutes. The motion of the moon, in the ſame time, 247 revolutions, 4 ſigns, 13 degrees, 34 minutes, 5 ſeconds; the motion of the lunar apogee, 2 revolutions, 3 ſigns, 3 degrees, 50 minutes, 15 ſeconds; and the motion of her nodes, 1 revolution, 26 degrees, 50 minutes, 15 ſeconds: all which motions are accounted from the vernal equinox. Wherefore, if from them be ſubſtracted the proceſſion of the equinoctial point during that ſpace, which is 16 minutes, there will remain the motions in reference to the fixed ſtars in 20 julian years, *viz.* The ſun's 19 revolutions, 11 ſigns, 29 degrees, 52 minutes, 24 ſeconds; of his apogee, 4 minutes, 20 ſeconds. The moon's 247 revolutions, 4 ſigns, 13 degrees, 17 minutes, 25 ſeconds; of her apogee, 2 revolutions, 3 ſigns, 3 degrees, 33 minutes, 35 ſeconds; and of her nodes, 1 revolution, 27 degrees, 6 minutes, 55 ſeconds.

According to this computation, the tropical year is 365 days, 5 hours, 48 minutes, 57 ſeconds; and the ſidereal year, 365 days, 6 hours, 9 minutes, 14 ſeconds.

But theſe mean motions of the luminaries being affected with the inequalities already mentioned, render a number of equations and reductions neceſſary.

The annual equations of the foreſaid mean motions of the ſun and moon, and of the apogee and nodes of the moon, have been already treated of in the article EQUATION.

Only let it be obſerved, that if the equation of the ſun's center be required to be added, then the equation of the moon's mean motion muſt be ſubſtracted, that of her apogee muſt be added, and that of the node ſubducted. And, on the contrary, if the equation of the ſun's center were to be ſubducted, the moon's equation muſt be added, the equation of her apogee ſubducted, and that of her node added.

There is alſo an equation of the moon's mean motion depending on the ſituation

of her apogee, in reſpect of the ſun; which is greateſt when the moon's apogee is in an octant with the ſun, and is nothing at all when it is in the quadratures or ſyzygies. This equation, when greateſt and the ſun in perigæo, is 3 minutes 56 ſeconds: but if the ſun be in apogæo, it will never be above 3 minutes 34 ſeconds. At other diſtances of the ſun from the earth, this equation, when greateſt, is reciprocally as the cube of ſuch diſtance. But, when the moon's apogee is any where but in the octants, this equation grows leſs, and is moſtly at the ſame diſtance between the earth and the ſun, as the ſine of the double diſtance of the moon's apogee from the next quadrature or ſyzygy to the radius. This is to be added to the moon's motion, while her apogee paſſes from a quadrature with the ſun to a ſyzygy; but this is to be ſubtracted from it, while the apogee moves from the ſyzygy to the quadrature.

There is, moreover, another equation of the moon's motion which depends on the aſpect of the nodes of the moon's orbit with the ſun: and this is greateſt, when her nodes are in octants to the ſun; and vaniſhes quite, when they come to their quadratures or ſyzygies. This equation is proportional to the ſine of the double diſtance of the node from the next ſyzygy or quadrature, and at greateſt is but 47 ſeconds. This muſt be added to the moon's mean motion, while the nodes are paſſing from their ſyzygies with the ſun to their quadratures with him; but ſubtracted, while they paſs from the quadratures to the ſyzygies.

From the ſun's true place take the equated mean motion of the lunar apogee, as was above ſhewed, the remainder will be the annual argument of the ſaid apogee. From hence the excentricity of the moon and the ſecond equation of her apogee, may be compared after the manner following (which takes place alſo in the computation of any other intermediate equations).

Let T (*ibid.* fig. 7.) repreſent the earth, TS a right line joining the earth and ſun, TACB a right line drawn from the earth to the middle or mean place of the moon's apogee, equated as above: let the angle STA be the annual argument of the aforeſaid apogee, TA the leaſt excentricity of the moon's orbit, TB the greateſt; biſect AB in C, and on the center C, with the diſtance AC, deſcribe a circle AFB, and make the angle BCF = to the double of the annual argument. Draw the right line TF; that ſhall be the excentricity of the moon's orbit; and the angle BTF is the ſecond equation of the moon's apogee required. In order to whoſe determination, let the mean diſtance of the earth from the moon, or the ſemidiameter of the moon's orbit, be 1000000; then ſhall its greateſt excentricity TB, be 66782 ſuch parts; and the leaſt TA, 43319. So that the greateſt equation of the orbit, *viz.* when the apogee is in the ſyzygies, will be 7 degrees, 39 minutes, 30 ſeconds, or perhaps 7 degrees, 40 minutes (for he ſuſpects there will be ſome alteration according to the poſition of the apogee in cancer or capricorn). But, when it is in quadrature to the ſun, the greateſt equation aforeſaid will be 4 degrees, 57 minutes, 56 ſeconds; and the greateſt equation of the apogee 12 degrees, 15 minutes, 4 ſeconds.

Having from theſe principles made a table of the equation of the moon's apogee, and of the excentricities of her orbit to each degree of the annual argument, from whence the excentricity TF and the angle BTF (*viz.* the ſecond and principal equation of the apogee) may eaſily be had for any time required: let the equation thus found be added to the firſt equated place of the moon's apogee, if the annual argument be leſs than 90 degrees, or greater than 180 degrees, and leſs than 270°, otherwiſe it muſt be ſubducted from it; and the ſum or difference ſhall be the place of the lunar apogee ſecondarily equated; which, being taken from the moon's place equated a third time, ſhall leave the mean anomaly of the moon correſponding to any given time. Moreover, from the mean anomaly of the moon, and the before found excentricity of her orbit, may be found (by means of a table of equations of the moon's center made to every degree of the mean anomaly, and ſome excentricities, *viz.* 45000, 50000, 55000, 60000, and 65000) the proſtaphæreſis or equation of the moon's center, as in the common way: and this being taken from the former ſemicircle of the middle anomaly, and added in the latter to the moon's place thus thrice equated, will produce the place of the moon a fourth time equated.

The greateſt variation of the moon (*viz.* that which happens when the moon is in an

an octant with the ſun) is nearly, reciprocally, as the cube of the diſtance of the ſun from the earth; let that be taken 37 minutes, 25 ſeconds, when the ſun is in perigæo, and 33 minutes, 40 ſeconds, when ſhe is in apogæo: and let the differences of this variation in the octants be made reciprocally as the cubes of the diſtances of the ſun from the earth; and ſo let a table be made of the aforeſaid variation of the moon in her octants (or its logarithms) to every 10th, 6th, or 5th diſtance of the mean anomaly: and, for the variation out of the octants, make, as radius to the ſine of the double diſtance of the moon from the next ſyzygy or quadrature: : ſo let the aforeſaid variation in the octant be to the variation congruous to any other aſpect; and this added to the moon's place before found in the firſt and third quadrant (accounting from the ſun) or ſubducted from it in the ſecond and fourth, will give the moon's place equated a fifth time.

Again, as radius to the ſine of the ſum of the diſtances of the moon from the ſun, and of her apogee from the ſun's apogee (or the ſine of the exceſs of that ſum above 360 degrees): : ſo is 2 minutes, 10 ſeconds, to a 6th equation of the moon's place, which muſt be ſubtracted, if the aforeſaid ſum or exceſs be leſs than a ſemicircle, but added, if it be greater. Let it be made alſo as radius to the ſine of the moon's diſtance from the ſun: : ſo 2 degrees 20 ſeconds to a ſeventh equation: which, when the moon's light is increaſing, add, but when decreaſing, ſubtract; and the moon's place will be equated a ſeventh time, and this is her place in her proper orbit.

But let it be obſerved, that the equation, thus produced by the mean quantity 2 degrees, 20 ſeconds, is not always of the ſame magnitude, but is increaſed and diminiſhed according to the poſition of the lunar apogee. For if the moon's apogee be in conjunction with the ſun's, the aforeſaid equation is about 54 ſeconds greater. But when the apogees are in oppoſition, it is about as much leſs; and it librates between its greateſt quantity 3 minutes 14 ſeconds, and its leaſt 1 minute 26 ſeconds. And this is when the lunar apogee is in conjunction or oppoſition with the ſun's: but in the quadratures, the aforeſaid equation is to be leſſened about 50 ſeconds, or 1 minute, when the apogees of the ſun and moon are in conjunction; but if they are in oppoſition, for want of a ſufficient number of obſervations, he cannot determine whether it is to be leſſened or increaſed. And, even as to the augment or decrement of the equation 2 minutes, 20 ſeconds, above-mentioned, he dares determine nothing certain, for the ſame reaſon, *viz.* the want of obſervations accurately made.

If the ſixth and ſeventh equations are augmented or diminiſhed in a reciprocal ratio of the diſtance of the moon from the earth, *i. e.* in a direct ratio of the moon's horizontal parallax, they will become more accurate: and this may readily be done, if tables are firſt made to each minute of the ſaid parallax, and to every ſixth or fifth degree of the augment of the ſixth equation for the ſixth, as of the diſtance of the moon from the ſun for the ſeventh equation.

From the ſun's place take the mean motion of the moon's aſcending node, equated as above; the remainder ſhall be the annual argument of the node, whence its ſecond equation may be computed after the following manner in the foregoing figure, *ibid.* fig. 7.

Let T, as before, repreſent the earth; TS a right line conjoining the earth and ſun: let alſo the line TACB be drawn to the place of the aforeſaid node of the moon, as above equated; and let STA be the annual argument of the node. Take TA from a ſcale, and let it be to AB: : as 56 to 3, or as $11\frac{2}{3}$ to 1. Then biſſect AB in C, and on C as a center, with the diſtance CA, deſcribe a circle, as AFB, and make the angle BCF, equal to double the annual argument of the node before found: ſo ſhall the angle BTF be the ſecond equation of the aſcending node; which muſt be added when the node is paſſing from the quadrature to a ſyzygy with the ſun, and ſubducted when the node moves from a ſyzygy towards a quadrature. By which means the true place of the node of the lunar orbit will be gained: whence, from tables made after the common way, the moon's latitude and the reduction of her orbit to the ecliptic may be computed, ſuppoſing the inclination of the moon's orbit to the ecliptic to be 4 degrees, 59 minutes, 35 ſeconds, when the nodes are in quadrature with the ſun; and 5 degrees, 17 minutes, 20 ſeconds, when they are in the ſyzygies.

And from the longitude and latitude thus found, and the given obliquity of the ecliptic 23 degrees, 29 minutes, the

right aſcenſion and declination of the moon will be found.

The horizontal parallax of the moon, when ſhe is in the ſyzygies a. a mean diſtance from the earth, he makes to be fifty-ſeven minutes, 30 ſeconds; and her horary motion 33 minutes, 32 ſeconds, 32 thirds; and her apparent diameter 31 minutes, 30 ſeconds. But in her quadratures, at a mean diſtance from the earth, he makes the horizontal parallax of the moon to be 59 minutes, 40 ſeconds; her horary motion 32 minutes, 12 ſeconds, 2 thirds; and her apparent diameter 31 minutes, 3 ſeconds: the moon in an octant to the ſun, and at a mean diſtance, hath her center diſtant from the center of the earth about $60\frac{2}{9}$ of the earth's ſemidiameters.

The ſun's horizontal parallax he makes to be 10 ſeconds, and its apparent diameter, at a mean diſtance from the earth, 32 minutes, 15 ſeconds.

The atmoſphere of the earth, by diſperſing and refracting the ſun's light, at leaſt to the height of 40 or 50 geographical miles, caſts a ſhadow upon the moon in a lunar eclipſe, and thereby makes the earth's ſhadow larger than it would otherwiſe be; and to each mile of the earth's atmoſphere, is correſpondent a ſecond in the moon's diſc: hence the ſemi-diameter of the earth's ſhadow, projected upon the moon's diſc, is to be increaſed about 50 ſeconds; or, which is all one in a lunar eclipſe, the horizontal parallax of the moon is to be increaſed in the ratio of about 70 to 69.

MOON-DIAL. See the article DIAL.

MOON-EYED, in the manege, the ſame with moon-blind. See BLIND.

MOON-FISH, a ſpecies of the oſtracion, otherwiſe called the orbis, or globe-fiſh. See the article OSTRACION.

MOON-SEED, *meniſpermum*, in botany. See the article MENISPERMUM.

MOON-TREFOIL, a plant otherwiſe called medicago. See MEDICAGO.

MOON-WORT, *lunaria*, in botany. See the article LUNARIA.

MOOR, in country affairs, denotes an unlimited tract of land, uſually over-run with heath.

MOOR-BUZZARD, the engliſh name of the yellow-legged falcon, with an iron-coloured body and yellow head. It is about the ſize of a common crow, and has its engliſh name from building its neſt in mooriſh and boggy places.

MOOR-COCK, or GOR-COCK, a ſpecies of tetrao, with a forked tail, ſpotted with white underneath. It is a native of England, but very rare: the male is throughout of a very deep iron-grey, without any variegation; and the female is alſo grey, but variegated with tranſverſe lines of black.

MOOR's HEAD, in the manege, &c. See the article HEAD.

MOOR-HEN, the engliſh name of the gallinula or tringa. See TRINGA.

MOOR-STONE, a valuable ſtone, much uſed in the coarſer works of the preſent builders; being truly a white granite, of a marbly texture.

MOOR-TITLING, in ornithology, a name by which many call the oenanthe. See the article OENANTHE.

MOORING, or MOARING, in the ſea-language, is the laying out the anchors of a ſhip in a place where ſhe can ride ſecure.

Mooring acroſs, is laying out an anchor on each ſide: and mooring along, is to have an anchor in a river and a hawſer on ſhore.

When ſhips are laid up in ordinary, or are under orders of fitting for the ſea, the moorings are laid out in harbours; and conſiſt of claws, pendent chains, cables, bridles, anchors, ſwivels, jew's-harps, buoys, and chains.

MOOT, a difficult caſe argued by the young barriſters and ſtudents at the inns of court, by way of exerciſe, the better to qualify them for practice, and to defend the cauſes of their clients. This, which is called mooting, is the chief exerciſe of the inns of court. Particular times are appointed for the arguing moot-caſes: the place where this exerciſe is performed, was antiently called moot-hall; and there is a bailiff, or ſurveyor of the moots annually choſen by the bench, to appoint the moot-men for the inns of chancery, and to keep an account of the performance of exerciſes.

MORA, a town of Spain, in the province of New Caſtile, eighteen miles ſouth-eaſt of Toledo.

MORAL, ſomething belonging to manners, or the conduct of life. See the articles GOOD, EVIL, &c.

MORAL PHILOSOPHY, the ſame with ethics. See the article ETHICS.

MORAL SENSE, that whereby we perceive what is good, virtuous, and beautiful in actions, manners, and characters. See SENSE, ACTION, CHARACTER, &c.

MORAL of a fable. See FABLE.

MORALITY, the ſcience and doctrine of morals, otherwiſe called ethics. See the article ETHICS.

Morality may be defined to be the relation, conformity, or agreement of men's voluntary actions, to a rule, to which they are referred, and by which they are judged of. Theſe moral rules ſeem to be of three ſorts, with their different enforcements. 1. The divine law, whether known by the light of nature or the voice of revelation, which is the only true touchſtone of moral rectitude, the conſciences of men bearing witneſs either of the goodneſs or ſinfulneſs of their actions; that is, whether as duties or ſins they are like to procure them happineſs, or miſery, from the hands of the Almighty. 2. The civil law, which is the rule ſet by the commonwealth to the actions of thoſe that belong to it: this rule no body overlooks, the rewards and puniſhments being ready at hand to enforce it, extending to the protecting or taking away of the life, liberty, and eſtate of thoſe who obſerve and diſobey it. 3. The law of opinion and reputation, whereby virtue and praiſe, vice and blame, are ever found to accompany each other: now thoſe who think not commendation and diſgrace ſufficient motives to engage mankind to accommodate themſelves to the opinions and rules of thoſe with whom they converſe, ſeem little ſkilled in the hiſtory of mankind, ſince moſt people govern themſelves chiefly by this law of faſhion. See the article RELATION.

Moral philoſophy contemplates human nature, its moral powers and connections, and from theſe deduces the laws of action: though it muſt be confeſſed, that different philoſophers have eſtabliſhed different ſyſtems concerning the foundation of morality, which the reader will find under the article ETHICS.

According to Mr. Locke, the idea of a ſupreme being, infinite in power, goodneſs, and wiſdom, whoſe workmanſhip we are, and on whom we depend, and the idea of ourſelves, as intelligent creatures, would, if duly conſidered, afford ſuch foundations of our duty and rules of action, as might place morality among the ſciences capable of demonſtration.

As to the reaſons why the mathematical ſciences have been thought more capable of demonſtration than the ideas of good and evil, right and wrong, &c. they are theſe. 1. That the former can be repreſented by ſenſible marks, as diagrams, which have a nearer correſpondence with them than any words. 2. Moral ideas are commonly more complex than thoſe of figures; whence it happens, that their names are of more uncertain ſignification; and beſides, the mind cannot eaſily retain theſe preciſe combinations ſo perfectly, as is neceſſary in the examination of the agreements and diſagreements of ſeveral of them one with another. See the article KNOWLEDGE.

One part of theſe diſadvantages in moral ideas, continues the ſame great author, may in a good meaſure be remedied by accurate definitions; ſetting down that collection of ſimple ideas which every term ſhall ſtand for, and then uſing the term ſteadily for that preciſe collection. See the article DEFINITION.

MORANT POINT, the moſt eaſterly promontary of the iſland of Jamaica: weſt long. 76° 30′, north lat. 18°.

MORASSE, a low, moiſt land, which receives the waters from the higher grounds without having any deſcent to carry them off. See MARSH and MOSS.

MORAT, or MURTEN, a town of Switzerland, in the canton of Bern, ſituated on the lake Morat, fifteen miles weſt of Bern.

MORATUR, or DEMORATUR, in law, he demurs; a term uſed when one of the parties in a cauſe demurs, and does not proceed in pleading, but reſts upon the judgment of the court in ſome particular point, either in relation to the ſufficiency of the declaration, or the pleas of the contrary party; upon which the court, after taking ſome time to argue and adviſe, determine the point.

MORAVA, a river of european Turky, that riſes in the mountain of Rodope, or Argentum, and falls into the Danube at Semendria, to the eaſtward of Belgrade.

MORAVIA, a marquiſate, or province in Bohemia, bounded by Sileſia on the north-eaſt, by Hungary and Auſtria on the ſouth; and by Bohemia on the north-weſt.

MORAVIANS, a ſect of proteſtants, who have been ſettled for a conſiderable time paſt at Hernhuth, in Germany, and have of late years ſpread themſelves over moſt of our American colonies, as well as in ſeveral parts of England, where they are permitted to ſettle by a late act of parliament. They have a kind of church-government peculiar to themſelves, and are commonly known by the name

name of *Unitas Fratrum*, or *The Brethren*. They profeſs the utmoſt veneration for our bleſſed Saviour, whom they conſider as their immediate Head and Director, enjoin the moſt implicit obedience to the rulers of their church, and are ſaid to practice much brotherly love amongſt one another. In ſhort, they ſeem to be a meek, peaceable, and induſtrious kind of people. They have nevertheleſs been lately accuſed of ſeveral erroneous principles and practices, to which accuſations they have either been totally ſilent, or given partial and unſatisfactory anſwers: but as theſe may proceed more from the weakneſs and enthuſiaſm of particular members than the conſtitution of their church itſelf, they perhaps think themſelves leſs obliged to take notice of them. It were to be wiſhed, however, that they would publiſh ſuch a plain and diſtinct account of their œconomy both in civil and religious matters, as might effectually clear them of all ſuſpicion of aiming at any thing inconſiſtent with the principles of the pureſt profeſſors of Chriſtianity.

MORAW, a river that riſes in the north of Moravia, and after dividing Auſtria from Hungary, falls into the Danube, to the weſtward of Preſburg.

MORBACH, or MURBACH, a town of Germany, in the circle of the upper Rhine, and landgraviate of Alſatia, forty miles ſouth of Straſburg, ſubject to France.

MORBID, among phyſicians, ſignifies diſeaſed or corrupt, a term applied either to an unſound conſtitution, or to thoſe parts or humours that are infected by a diſeaſe. See the article DISEASE.

MORBILLI, the meaſles, in medicine. See the article MEASLES.

MORBUS, DISEASE, in medicine. See the article DISEASE.

MORDELLA, in zoology, a genus of the coleoptera claſs of inſects, the antennæ whereof are ſlender, and have the laſt joint globoſe; moſt of the ſpecies have alſo legs, which ſerve them for leaping.

MOREA, the antient Peloponneſus, is a province of european Turky, and is a peninſula about one hundred and eighty miles long, and one hundred and thirty broad, bounded by the gulphs of Lepanto and Engia on the north; by the egean ſea, or Archipelago, on the eaſt; and by the Mediterranean on the ſouth and weſt.

MORESK, or MORISCO, is a kind of painting, carving, &c. done after the manner of the moors; conſiſting of ſeveral groteſque pieces and compartments, promiſcuouſly mingled, not containing any perfect figure of a man, or other animal; but a wild reſemblance of birds, beaſts, trees, &c.

Moreſk-dances, vulgarly called morrice-dances, are thoſe altogether in imitation of the moors, as ſarabands, chacons, &c. which are generally performed with caſtanets or tambours.

MORETON, a market-town of Devonſhire, twelve miles ſouth-weſt of Exeter.

MORETON, is alſo a market-town of Gloceſterſhire, twenty miles north-eaſt of Gloceſter.

MORGAY, in ichthyology, the ſqualus with a variegated back, and with the belly fins concreted. See SQUALUS.

The head of this ſpecies is large, and of a depreſſed form; the eyes are large, and ſtand pretty high on the ſides of the head; the noſtrils are very conſpicuous, they have each a double aperture; the mouth is on the under part of the roſtrum, and opens tranſverſely; the apertures of the gills are five, oblique, or nearly tranſverſe openings on each ſide below the head, and reaching to the pectoral fins.

MORINA, in botany, a plant of the diandria-monogynia claſs, with a monopetalous flower, bilabiated at the limb: the ſeed is ſingle, roundiſh, and coronated with the cup of the flower.

MORINDA, in botany, a genus of the pentandria-monogynia claſs of plants, with an infundibuliform monopetalous flower, divided into five ſegments at the limb: the fruit is a roundiſh berry, with an umbilicated point, and contains two elliptico-hemiſpherical ſeeds.

MORINELLUS, the DOTTEREL, in ornithology, a ſpecies of charadrius, with a ferrugineous breaſt, and a white ring round the neck. See CHARADRIUS.

MORISONA, a plant belonging to the polyandria-monogynia claſs, the flower of which conſiſts of four oblong petals; and its fruit is a globoſe berry, containing a great many kidney-ſhaped ſeeds.

MORLACHIA, a province of Venice; having Dalmatia on the ſouth, and lying between the provinces of Croatia and Boſnia.

MORLAIX, a port-town of France, in the province of Britany: weſt long. 4°, north lat. 48° 37′.

MORMYLUS, in ichthyology, the ſparus

with the upper jaw longeſt, and with twelve parallel tranſverſe black lines on each ſide. See the article SPARUS.

MORNING, the beginning of the day, the firſt appearance of light, or the time from midnight till noon.

MOROCCO, the capital of the kingdom of the ſame name in Africa; weſt long. 9°, north lat. 32°.

MOROCCO, *marroquin*, in commerce, a fine kind of leather, prepared of the ſkin of an animal of the goat kind, and imported from the Levant, Barbary, &c.

The name was probably taken from the kingdom of Morocco, whence the manner of preparing it was borrowed, which is this: the ſkins being firſt dried in the hair, are ſteeped in clear water three days and nights; then ſtretched on a tanner's horſe, beaten with a large knife, and ſteeped afreſh in water every day till they be well come: then they are thrown into a large vat in the ground full of water, where quick-lime has been ſlaked, and there lie fifteen days; whence they are taken, and again returned every night and morning. Then they are thrown into a freſh vat of lime and water, and ſhifted night and morning for fifteen days longer; then rinſed in clear water, and the hair taken off on the leg with the knife, returned into a third vat and ſhifted as before for eighteen days; ſteeped twelve hours in a river, taken out, rinſed, put in pails, where they are pounded with wooden peſtles, changing the water twice; then laid on the horſe, and the fleſh taken off; returned into pails of new water, taken out, and the hair ſide ſcraped; returned into freſh pails, taken out, and thrown into a pail of a particular form, having holes at bottom: here they are beaten for the ſpace of an hour, and freſh water poured on from time to time; then being ſtretched on the leg, and ſcraped on either ſide, they are returned into pails of freſh water, taken out, ſtretched and ſewed up all round in manner of bags, leaving out the hinder legs as an aperture for the conveyance of a certain mixture.

The ſkins thus ſewed are put in lukewarm water, where dogs excrements have been diſſolved. Here they are ſtirred with long poles for half an hour, left at reſt a dozen, taken out, rinſed in freſh water, and filled by a tunnel with a preparation of water and ſumac, mixed and heated over the fire till ready to boil; and, as they are filled, the hind legs are ſewed up to ſtop the paſſage. In this ſtate they are let down into the veſſel of water and ſumac, and kept ſtirring for four hours ſucceſſively; taken out and heaped on one another; after a little time their ſides are changed; and thus they continue an hour and a half, till drained. This done, they are looſened, and filled a ſecond time with the ſame preparation, ſewed up again, and kept ſtirring two hours, piled up, and drained as before. This proceſs is again repeated, with this difference, that they are now ſtirred only a quarter of an hour; after which they are left till next morning, when they are taken out, drained on a rack, unſewed, the ſumac taken out, folded in two from head to tail, the hair-ſide outwards, laid over each other on the leg, to perfect their draining, ſtretched out and dried; then trampled under foot by two and two, ſtretched on a wooden table, what fleſh and ſumac remains ſcraped off, the hair-ſide rubbed over with oil, and that again with water.

Then they are wrung with the hands, ſtretched, and preſſed tight on the table with an iron-inſtrument like that of a currier, the fleſh-ſide uppermoſt; then turned, and the hair-ſide rubbed ſtrongly over with a handful of ruſhes, to ſqueeze out as much of the oil remaining as poſſible. The firſt courſe of black is now laid on the hair-ſide, by means of a lock of hair twiſted and ſteeped in a kind of black dye, prepared of ſour beer, wherein pieces of old ruſty iron have been thrown. When half dried by hanging in the air, they are ſtretched on a table, rubbed over every way with a paumelle, or wooden-toothed inſtrument, to raiſe the grain, over which is paſt a light couche of water, then ſleeked by rubbing them with ruſhes prepared for the purpoſe. Thus ſleeked, they have a ſecond couche of black, then dried, laid on the table, rubbed over with a paumelle of cork, to raiſe the grain again; and, after a light couche of water, ſleeked over anew; and, to raiſe the grain a third time, a paumelle of wood is uſed.

After the hair-ſide has received all its preparations, the fleſh-ſide is pared with a ſharp knife for the purpoſe; the hair-ſide is ſtrongly rubbed over with a woollen cap, having before given it a gloſs with barberries, citron, or orange. The whole is finiſhed by raiſing the grain lightly, for the laſt time, with the paumelle of cork; ſo that they are now fit for the market.

Manner

Manner of preparing red MOROCCO: after ſteeping, ſtretching, ſcraping, beating, and rinſing, as before, they are at length wrung, ſtretched on the leg, and paſſed after each other into water where alum has been diſſolved. Thus alumed, they are left to drain till morning, then wrung out, pulled on the leg, and folded from head to tail, the fleſh inwards.

In this ſtate they receive their firſt dye, by paſſing them after one another into a red liquor, prepared with laque, and ſome other ingredients, which the maroquineers keep a ſecret. This they repeat again and again, till the ſkins have got their firſt colour; then they are rinſed in clear water, ſtretched on the leg, and left to drain twelve hours; thrown into water, into which white galls pulverized have been paſt through a ſieve, and ſtirred inceſſantly for a day with long poles; taken out, hung on a bar a-croſs the water all night, white againſt red, and red againſt white, and in the morning the water ſtirred up, and the ſkins returned into it for twenty-four hours.

MOROCHTHUS, in natural hiſtory, an indurated clay, called by us french-chalk; ſerving taylors and others to mark with. The antients eſteemed it as an aſtringent, preſcribing it in the colic, hæmorrhages, and other fluxes. See the article LAPIS.

MORON, a town of Spain, in the province of Andaluſia, thirty miles ſouth-eaſt of Seville.

MORPETH, a borough-town of Northumberland, fourteen miles north of Newcaſtle, which ſends two members to parliament.

MORPHEW, a leprous kind of ſcurf which ſometimes breaks out upon the ſkin, particularly about the forehead. See the article LEPROSY.

MORSE, in zoology, a name by which ſome call the hippopotamus. See the article HIPPOPOTAMUS.

MORT D' ANCESTOR, in law. See the article ASSISE *of mort d' anceſtor*.

MORTAIGN, a town of the Orleanois, in France: eaſt long. 50′, and north lat. 48° 40′.

MORTAIN, a town of Normandy, in France: weſt long. 50′, and north lat. 48° 49′.

MORTALITY, or *bills of* MORTALITY, properly denote weekly liſts of the perſons who die in any place.

In London, theſe bills are drawn up by the company of pariſh-clerks, and contain an account of the numbers, ages, diſeaſes, &c. of ſuch as die within the bills of mortality; that is, in London, Weſtminſter, and ten miles round.

The great diſparity between the births and burials in London, is owing to this, that the diſſenters of all ſorts baptize their children without ſending an account of them to the pariſh clerks; ſo that little dependance is to be had on theſe, with regard to calculating annuities for life.

Dr. Halley's table, grounded on the Breſlau bills of Mortality, is of much more authority: it ſhews alternately the age, and the number of perſons living of that age.

Age.	Perſons living	Age.	Perſons living.	Age.	Perſons living.	Age.	Perſons living
1	1000	22	586	43	417	64	202
2	855	23	579	44	407	65	192
3	798	24	573	45	397	66	182
4	760	25	567	46	387	67	172
5	732	26	560	47	377	68	162
6	710	27	553	48	367	69	152
7	692	28	546	49	357	70	142
8	680	29	539	50	346	71	131
9	670	30	531	51	335	72	120
10	661	31	523	52	324	73	109
11	653	32	515	53	313	74	98
12	646	33	507	54	302	75	88
13	640	34	499	55	292	76	78
14	634	35	490	56	282	77	68
15	628	36	481	57	272	78	58
16	622	37	472	58	262	79	49
17	616	38	463	59	252	80	4
18	610	39	454	60	242	81	34
19	604	40	445	61	232	82	28
20	598	41	436	62	222	83	23
21	592	42	427	63	212	84	20

By the help of this table, we can find what probability there is, that a man of a certain age, 30 for example, ſhall live 1, 2, 3, &c. years. Thus, againſt 30 we find 531, and underneath this 523, 515, &c. the meaning of which is, that out of 531 perſons living at the age of 30, there remain only 523, 515, &c. who attain the age of 31, 32, &c. reſpectively.

Hence ſuppoſing A, B, C, &c. to repreſent, reſpectively, the perſons living at a given age and the ſubſequent years; it is evident, that there being A perſons living of the given year, and only B perſons remaining after the firſt year, the probability that a perſon of the given

age ſhall live one year, is meaſured by the fraction $\frac{B}{A}$; and, in the ſame manner, the probability that he ſhall live two years, is meaſured by the fraction $\frac{C}{A}$, and ſo on. Thus the probability that a perſon of 30 years of age ſhall live one year, is meaſured by $\frac{523}{8}$; that is, he has the odds of 523 to 8, or nearly 65 to 1, that he does not die in a year. So, likewiſe, to find the odds that any perſon does not die before he attain any propoſed age, the rule is this: ſubtract the number of the remaining perſons of the age propoſed, from thoſe of the firſt age, and that will ſhew the odds there is of the perſon's living or dying; as for inſtance, the odds that a man of 40 ſhall live 7 years, is found by ſubſtracting 377, the number of perſons of 47 years from 445, the number of perſons of 40 years, and the difference 68, is the number of perſons dying in that 7 years: hence the odds is 377 to 68, or $5\frac{1}{2}$ to 1, that a man of 40 does live ſeven years; and the like for any other number of years.

From what has been ſaid it appears, that the price of inſurance upon lives ought to be regulated; there being a great difference between inſuring the life of a man of 20, and that of another of 50 years of age; ſince it is 100 to 1 that the man of 20 dies not in a year; and but 38 to 1 for a man of 50 years of age. See the article LIFE.

MORTAR, a preparation of lime and ſand mixt up with water, which ſerves as a cement, and is uſed by maſons and bricklayers in building of walls of ſtone and brick.

The proportion of lime to ſand in making mortar, ought to be according to the goodneſs or badneſs of theſe materials, and is therefore rather to be regulated by the judgment of experienced workmen than by any ſtated proportion of materials. It is, however, neceſſary to obſerve, that the beſt ſand for making lime, according to Wolfius, is that which is coarſe and ſharp, ſo as to prick the hands when rubbed, and yet not earthy, and ſo as to foul the water it is waſhed in: and that the beſt lime for the ſame purpoſe is that made of the hardeſt ſtones. See the article LIME.

Beſides the common mortar uſed in laying ſtones, bricks, &c. there are ſeveral other kinds; as, 1. White mortar, uſed in plaſtering walls and ceilings, which are often firſt plaſtered with loam, and is made of ox or cow-hair mixed and tempered with lime and water without any ſand. The common allowance is one buſhel of hair to ſix of lime; the hair binds the mortar, holds it faſt together, and keeps it from cracking. 2. Mortar for furnaces, &c. is made with red clay wrought in water in which horſe-dung and chimney-ſoot has been ſteeped, by which a ſalt is communicated to the water, which binds the clay, and makes it fit to endure the fire: this clay ought not to be too fat, leſt it ſhould be ſubject to crack; nor too lean or ſandy, leſt it ſhould not bind enough. 3. Some workmen in metals, uſe a kind of mortar to plaſter over the inſide of the veſſels in which they refine their metals, to keep them from running out: this kind of mortar is made with quick-lime and ox-blood, the lime being firſt beaten to powder and ſifted, and afterwards mixed with the blood. 4. Mortar for ſun-dials on walls, may be made of lime and ſand tempered with linſeed-oil, or, for want of the latter, with ſkimmed milk; but oil is better. This ſpread upon the wall will become as hard as ſtone, and will endure the weather ſix times as long as the ordinary plaſter made of lime and hair with water. 5. For plaſtering the fronts of houſes in imitation of brick-work, ſome uſe a mortar made of ſharp ſand and lime, powder of brick and ſome red ochre: and timber-houſes, plaſtered over with this kind of mortar, look well though they have been done twenty or thirty years. 6. The mortar uſed in Italy for making water-courſes and ciſterns, and alſo in finiſhing or plaſtering of fronts is of two ſorts: the one is compoſed of lime and hogs-greaſe, mixt with the juice of figs, and the other is of the ſame ingredients, but has liquid pitch added to the reſt, and is firſt wet or ſlacked with wine, and then pounded or beaten with hogs greaſe and juice of figs. 7. An extraordinary good mortar for floors, walls, cielings, &c. may be made with ox-blood and fine clay tempered together. 8. And in buildings, one part of waſte ſoap-aſhes, mixed with another of lime and ſand, make a very durable mortar.

MORTAR-PIECE, a ſhort piece of ordnance, conſiderably thick and wide; ſerving to throw bombs, carcaſſes, fire-pots, &c. See plate of gunnery, fig. 4. which

4. which represents a mortar mounted on its carriage.

The use of mortars is thought to be older than that of cannon; they being employed in the wars in Italy to throw stones and balls of red-hot iron, long before the invention of bombs; which, as Blondel informs us, were first thrown at the siege of Wachtendorch, in Guilderland, in 1588.

It was formerly the opinion of gunners, that only one certain charge of powder was requisite for each mortar, and that the horizontal range could not be altered but by changing the direction of the piece; but, at present, when a place lying in the same horizontal plane with the mortar, is to be bombarded, they elevate the piece to 45°, and augment or diminish the charge of powder until they can hit the mark. The following advantages introduced this practice: 1. The public powder is saved as much as possible; because, at a direction of 45°, a less velocity, and consequently a less charge of powder is required to make any horizontal range, than is necessary to make the same horizontal range at any other elevation. 2. In elevating mortars to their proper directions, gunners seldom come within a degree or two of the proposed elevation, both on account of the imperfection of the instruments which they generally use for that purpose, and the hurry they are in at that time. And in bombarding towns from ships, it is scarce possible to come within two degrees of the designed elevation, because of the agitation of the vessel, which continually changes the direction of the mortar. But by raising the mortar to 45°, the bad consequences of this inaccuracy of elevation are in a great measure prevented, because a small error above or below 45°, occasions a very inconsiderable error of amplitude.

For the same reasons, also, places lying above or below the horizontal plane, passing through the piece, are bombarded by directing the mortar so as its axis may bisect the angle comprehended between a perpendicular to the horizon, at the point of projection, and a line drawn from that point to the mark aimed at; and then augmenting and diminishing the charge of powder until the object be hit.

When the business, therefore, can be effectually done by this middle elevation, it ought certainly to be preferred to any other. However, in the course of a siege it frequently happens, that several of the cases mentioned under the article GUNNERY, are made use of either by the assailants or defendants. Whence we may infer, that though mortars are oftenest, and most fitly, used at 45° elevation, yet they ought not to be founded of one piece with their bed, because such are not only very costly but unweildy, and therefore unfit to be raised to any desired elevation. See GUNNERY.

Mortars are most fit for service when hung by trunnions and propped with quoins, especially if their carriages be steady enough to prevent the effects of sudden recoiling.

In shooting with mortars, the following general rules should be always observed. 1. To measure the distance of the object aimed at. 2. That the bombs be of equal weight, otherwise the shots will vary. 3. That the carriage be on an exact level, to prevent its leaping. 4. That the powder with which the piece is charged, be always of the same strength and quantity. 5. That the charge be always equally rammed down. 6. That the wads be always of wood, tompions, or oakam. 7. That the fusees be fresh made the days on which they are to be used; and that they be of a composition proportionable to the range of the shot in the air, so that the bomb may break at the very moment of, or soon after its fall; which composition must be such as not to be extinguished though it fall in water, but continue burning till the bomb breaks. See the article BOMB.

MORTARO, or MONTARA, a town of the dutchy of Milan, in Italy, twenty miles north-east of Casal, and subject to the king of Sardinia.

MORTGAGE, in law, a pledge or pawn of lands, tenements, &c. for money borrowed; so called because if the money is not paid at the day, the land dies to the debtor, and is forfeited to the creditor. The common method of making a mortgage, is by lease for a long term of years, wherein a peppercorn rent has been usually reserved: or it may be made by assignment for a term, and by lease and release. The creditor, who holds the estate according to the condition of the deed, is called the mortgagee; but the mortgager, who is the person that makes the mortgage, generally keeps possession of the land till failure is made in the payment of the mortgage-money;

money; in which caſe, though the mortgagee enters for non-payment, the mortgager has a right to the equity of redemption in the court of chancery, where he may call the mortgagee to an account for the profits of the land mortgaged.

In a mortgage is contained a proviſo or covenant, that in caſe the money be paid on the day limited, the deed ſhall thereupon be void: but on the mortgager's paying the intereſt of the money, mortgages are frequently continued without diſturbing the poſſeſſion. Where an old mortgage is aſſigned to another, it is to be taken for a new one from the time of the aſſignment; and as a mortgagee, where the mortgage is forfeited, is allowed intereſt for his intereſt, ſo an aſſignee is to have it for all intereſt due at the time of the aſſignment, which muſt be accounted as principal whenever he comes to redeem the land: but yet an agreement made at the ſame time with the original mortgager, will not make future intereſt to be principal before any is become due. It has alſo been decreed, that where a mortgagee lends more money on bond to the mortgager, the latter ſhall not be permitted to redeem, except he pay the money lent upon the bond, together with that on the mortgage; though if the mortgager mortgage the equity of redemption to another, the ſecond mortgagee will not be affected by this bond; for this reaſon, becauſe it is but a perſonal charge on the mortgager. By a late ſtatute it is ordained, that when any action of ejectment is brought by a mortgagee, for the recovery of the poſſeſſion of the lands or tenements, &c. mortgaged, and there is no ſuit in equity for foreclosing or redeeming the equity of redemption, in caſe the perſon intitled to redeem ſhall, pendente lite, or pending the action, bring all the principal and intereſt due, with coſts, into court, it ſhall be taken as a full ſatisfaction and diſcharge of the mortgage, and the mortgagee ſhall thereon be obliged to reconvey the land, &c. and deliver up all deeds, &c. 7 Geo. 2. c. 20.

MORTIER, an enſign of dignity, borne by the chancellor, and grand preſidents of the parliaments of France. That borne by the chancellor, is a piece of cloth of gold, edged and turned up with ermine; and that of the firſt preſident is a piece of black velvet edged with a double row of gold lace, while that of the other preſidents is only edged with a ſingle row. This they formerly carried on their heads, as they do ſtill in grand ceremonies, ſuch as the entry of the king: but, ordinarily, they carry them in the hand.

MORTIFICATION, in medicine, the ſame with ſphacelus. See SPHACELUS.

MORTISE, or MORTOISE, in carpentry, &c. a kind of joint, wherein a hole of a certain depth is made in a piece of timber, which is to receive another piece called a tenon.

MORTMAIN, in law, is the alienation of lands or tenements to any religious houſe, corporation, or fraternity, and their ſucceſſors. Lands alienated in mortmain are different from others, for they never revert to the donor, or to any temporal or common uſe; on which account the lords by ſuch alienation loſe their eſcheats, and many ſervices that were formerly due to them; as bodies politic never die, nor can perform perſonal ſervice, commit treaſon, felony, or the like. By the ſtatute of mortmain lately made, it is enacted, that no manors, lands, &c. ſhall be given or granted to, or ſettled upon any perſons, bodies politic, &c. for any eſtate whatſoever, or charged in truſt for charitable uſes, unleſs it be done by deed indented and ſealed twelve months at leaſt before the donor's death, and inrolled in chancery within ſix months after executed. The two Univerſities, and the colleges of Eaton, Weſtminſter, &c. are excepted out of this act. 9 Geo. II. c. 36.

MORTUARY, in the eccleſiaſtical law, is a gift left by a man at his death to his pariſh-church, in recompence of perſonal tythes omitted to be paid in his lifetime: or it is that beaſt, or other cattle, which, after the death of the owner, by the cuſtom of the place, is due to the parſon or vicar, in lieu of tithes or offerings forgot, or not well and truly paid by him that is dead.

A mortuary is not properly due to an eccleſiaſtical incumbent from any but thoſe of his own pariſh: but by cuſtom, in ſome places, it is paid to the incumbents of other pariſhes, when a corpſe is carried through them. The biſhops of Bangor, Landaff, St. David's, &c. had formerly mortuaries of prieſts: and it was cuſtomary in the dioceſe of Cheſter, for the biſhop to have a mortuary, on the death of every prieſt dying within the archdeaconry of Cheſter, of his beſt beaſt, ſaddle,

ſaddle, and bridle, with his beſt cloak, hat, and upper garment under the gown. Mortuaries are not now paid in kind; but money is to be given in lieu of them. By a ſtatute of Hen. VIII. they are to be paid as follows: he that dies poſſeſſed of moveable goods to the value of 40l. or above, is to pay 10s. he that dies poſſeſſed of goods of 30l. value, and under 40l. is to pay 6s. 8d. and ſo on in proportion; but if the goods are under the value of 6l. 13s. 4d. after the deceaſed's debts are paid, no mortuary is to be demanded. It is to be obſerved, that no mortuaries are to be paid, except in thoſe places where they are due by cuſtom.

MORTUUM CAPUT. See the article CAPUT MORTUUM.

MORVIEDRO, or MURVIEDRO, a town of Spain, in the province of Valencia, eighteen miles north of the city of Valencia.

MORUS, the MULBERRY TREE, in botany, &c. See MULBERRY.

MOSAIC, or MOSAIC-WORK, an aſſemblage of little pieces of glaſs, marble, precious ſtones, &c. of various colours, cut ſquare, and cemented on a ground of ſtucco, in ſuch a manner as to imitate the colours and degradations of painting.

Method of performing MOSAIC-WORK of glaſs is this: they provide little pieces of glaſs, of as many different colours and ſizes as poſſible. See the article *Painting in* GLASS.

Now in order to apply theſe ſeveral pieces, and out of them to form a picture, they in the firſt place procure a cartoon or deſign to be drawn; this is transferred to the ground or plaſter by calking, as in painting in freſco. See the article FRESCO.

As this plaſter is to be laid thick on the wall, and therefore will continue freſh and ſoft a conſiderable time, ſo that there may be enough prepared at once, to ſerve for as much work as will take up three or four days.

This plaſter is compoſed of lime, made of hard ſtone, with brick-duſt very fine, gum tragacanth, and whites of eggs: when this plaſter has been thus prepared and laid on the wall, and made the deſign of what is to be repreſented; they take out the little pieces of glaſs with a pair of plyers, and range them one after another, ſtill keeping ſtrictly to the light, ſhadow, different teints and colours repreſented in the deſign before; preſſing or flatting them down with a ruler, which ſerves both to ſink them within the ground, and to render the ſurface even.

Thus in a long time, and with a great deal of labour, they finiſh the work, which is ſtill the more beautiful, as the pieces of glaſs are more uniform, and ranged at an even height.

Some of theſe pieces of moſaic-work are performed with that exactneſs, that they appear as ſmooth as a table of marble, and as finiſhed and maſterly as a painting in freſco; with this advantage, that they have a fine luſtre, and will laſt ages.

The fineſt works of this kind that have remained till our time, and thoſe by whom the moderns have retrieved the art, which was in a manner loſt, are thoſe in the church of St. Agnes, formerly the temple of Bacchus at Rome; and ſome at Piſa, Florence, and other cities of Italy. The moſt eſteemed among the works of the moderns are thoſe of Joſeph Pine, and the chevalier Lanfranc in the church of St. Peter at Rome: there are alſo very good ones at Venice.

Method of performing MOSAIC-WORK of marble and precious ſtones is this: the ground of moſaic-works, wholly marble, is uſually a maſſive marble, either white or black. On this ground the deſign is cut with a chiſſel, after it has been firſt calqued. After it has been cut of a conſiderable depth, *i. e.* an inch or more, the cavities are filled up with marble of a proper colour, firſt faſhioned according to the deſign, and reduced to the thickneſs of the indentures with various inſtruments. To make the pieces thus inſerted into the indentures cleave faſt, whoſe ſeveral colours are to imitate thoſe of the deſign, they uſe a ſtucco, compoſed of lime and marble-duſt; or a kind of maſtic, which is prepared by each workman, after a different manner peculiar to himſelf.

The figures being marked out, the painter or ſculptor himſelf draws with a pencil the colours of the figures, not determined by the ground, and in the ſame manner makes ſtrokes or hatchings in the place, where ſhadows are to be; and after he has engraven with the chiſſel all the ſtrokes thus drawn, he fills them up with a black maſtic, compoſed partly of burgundy-pitch poured on hot; taking off afterwards what is ſuperfluous, with a piece of ſoft ſtone or brick, which, together

gether with water and beaten cement, takes away the maſtic, poliſhes the marble, and renders the whole ſo even that one would imagine it only conſiſted of one piece.

This is the kind of moſaic-work, that is ſeen in the pompous church of the invalids at Paris, and the fine chapel at Verſailles, with which ſome intire apartments of that palace are incruſtated.

As for moſaic-work of precious ſtones, other and finer inſtruments are required than thoſe uſed in marble; as drills, wheels, &c. uſed by lapidaries and engravers on ſtone. As none but the richeſt marbles and ſtones enter this work, to make them go the further, they are ſawn into the thinneſt leaves imaginable, ſcarce exceeding half a line in thickneſs; the block to be ſawn is faſtened firmly with cords on the bench, and only raiſed a little on a piece of wood, one or two inches high. Two iron-pins, which are on one ſide the block, and which ſerve to faſten it, are put into a vice contrived for the purpoſe, and with a kind of ſaw or bow, made of fine braſs-wire, bent on a piece of ſpongy wood, together with emery ſteeped in water, the leaf is gradually faſhioned by following the ſtroke of the deſign, made on paper, and glued on the piece. When there are pieces enough faſtened to form an intire flower, or ſome other part of the deſign, they are applied to the ground.

The ground which ſupports this moſaic-work is uſually of free-ſtone. The matter with which the ſtones are joined together, is a maſtic, or kind of ſtucco, laid very thin on the leaves as they are faſhioned; and this being done the leaves are applied with plyers.

If any contour, or ſide of a leaf, be not either ſquared or rounded ſufficiently, ſo as to fit the place exactly, into which it is to be inſerted, when it is too large, it is to be brought down with a braſs-file or raſp; and if it be too little, it is managed with a drill and other inſtruments uſed by lapidaries.

Moſaic-work of marble is uſed in large works as in pavements of churches, baſilics, and palaces; and in the incruſtation and vaneering of the walls of the ſame edifices.

As for that of precious ſtones, it is only uſed in ſmall works, as ornaments for altar-pieces, tables for rich cabinets, precious ſtones being ſo very dear.

Manner of performing MOSAIC-WORK *of gypſum.* Of this ſtone calcined in a kiln, and beaten in a mortar, and ſifted, the french workmen make a ſort of artificial marbles, imitating precious ſtones, and of theſe they compoſe a kind of moſaic-work, which does not come far ſhort, either of the durableneſs or the vivacity of the natural ſtones; and which beſides has this advantage, that it admits of continued pieces or paintings of intire compartiments without any viſible joining.

Some make the ground of plaſter of Paris, others of free-ſtone. If it be of plaſter of Paris, they ſpread it in a wooden frame, of the length and breadth of the work intended, and in thickneſs about an inch and a half. This frame is ſo contrived, that the tenons being only joined to the mortiſes by ſingle pins, they may be taken aſunder, and the frame be diſmounted, when the plaſter is dry. The frame is covered on one ſide with a ſtrong linen-cloth, nailed all round, which being placed horizontally with the linen at the bottom, is filled with plaſter paſſed through a wide ſieve. When the plaſter is half dry, the frame is ſet up perpendicularly, and left till it is quite dry; then it is taken out, by taking the frame to pieces.

In this moſaic, the ground is the moſt important part. Now in order to the preparation of this ſifted gypſum, which is to be applied on this ground, it is diſſolved and boiled in the beſt engliſh glue, and mixt with the colour that it is to be of, then the whole is worked up together into the uſual conſiſtence of plaſter; and then is taken and ſpread on the ground five or ſix inches thick. If the work be ſuch, as that mouldings are required, they are formed with gouges and other inſtruments.

It is on this plaſter, thus coloured like marble or precious ſtone, and which is to ſerve as a ground to a work, either of lapis, agate, alabaſter, or the like, that the deſign to be repreſented is drawn; having been firſt pounced or calqued. To hollow or impreſs the deſign, they uſe the ſame inſtruments that ſculptors do; the ground whereon they are to work not being much leſs hard than the marble itſelf. The cavities being thus made in the ground, are filled up with the ſame gypſum boiled in glue, only differently coloured, and thus are the different colours of the original repreſented. In order that the neceſſary colours and teints may

may be ready at hand, the quantities of the gypſum are tempered with the ſeveral colours in pots.

After the deſign has been thus filled and rendered viſible, by half poliſhing it with brick and ſoft ſtone, they go over it again, cutting ſuch plates as are either to be weaker or more ſhadowed, and filling them with gypſum; which work they repeat, 'till all the colours being added one after the other, repreſent the original to the life.

When the work is finiſhed, they ſcour it with ſoft ſtone, ſand, and water; after that, with a pumice-ſtone; and in the laſt place poliſh it with a wooden mullet and emery. Then, laſtly, they give it a luſtre, by ſmearing it over with oil, and rubbing it a long time with the palm of the hand, which gives it a luſtre, no ways inferior to that of natural marble.

If you would only make a variegated table, or other work, of ſeveral colours, without moſaic-figures, the proceſs is ſomewhat different.

In this caſe, you are to prepare colours ſeparately in bowls, as many as nature ſhews in the marble to be imitated; and after you have incorporated them with gypſum and glue-water, take a trowel full of each, and diſpoſe them in a trough, without any order, then without mingling them, and only by cutting or croſſing the gypſum of each trowel, once with each of the reſt, they give them that beautiful confuſion, which renders natural marble valuable. Of theſe you may make tables, or lay them in a mould according to the work to be done.

Moſaic-work of wood is more properly called marquetry. See MARQUETRY.

MOSAMBIQUE, the capital of a province of the ſame name in Zanguebar, in Africa, ſituated on an iſland at the mouth of the river Moſambique: eaſt long. 40°, ſouth lat. 15°.

MOSBACH, or MORSBACH, a town of Germany, in the palatinate of the Rhine, ſixteen miles eaſt of Heidelburg.

MOSCHUS, the MUSK-ANIMAL, a genus of quadrupeds of the order of the pecora, having no horns; the canine teeth of the upper jaw are exerted. Of this genus there is only one known ſpecies, which is the animal that produces the perfume from which it is named. See the article MUSK.

This creature when full grown is three feet in length, from the tip of the noſe to the rump; the head is oblong, and the anterior part much like the greyhound; the ears are large and erect, they reſemble thoſe of the rabbit, and are equal in length to the diameter of the forehead; the tail is not more than two inches in length, and the creature always carries it erect; the body is tolerably fleſhy, and rounded; the legs about a foot in length, and very robuſt; the feet deeply divided, each into two claws in the anterior part, and as many heels behind. The fur on the head and that on the legs is about half an inch long, that on the belly is an inch and a half, and that which grows on the back three inches; theſe hairs are thicker than in any other known animal, and are variegated, from the baſe to the extremity, with diſtinct ſpaces of brown and white: the veſſel or bag in which the perfume called muſk is contained, is three inches long and two broad, and hangs under the belly, protuberating near three quarters of an inch beyond the ſurface.

MOSCOW, the capital of the province of the ſame name in Muſcovy, ſituated on the river Moſcowa, 360 miles ſouth-eaſt of Peterſburg: eaſt long. 38°, north lat. 55° 45′.

MOSCOWA, a river which riſes in the weſt part of the province of Muſcow, and falls into the river Ocka at Kolomna.

MOSELLE, a river of Germany, which riſes in the mountains of Vauge, in Lorrain, and running through that dutchy and the electorate of Triers, falls into the Rhine at Coblentz.

MOSKITO, a country of North America, ſituated between 85° and 88° of weſt longitude, and between 13° and 15° of north latitude; having the north-ſea, on the north and eaſt; Nicaragua, on the ſouth; and Honduras on the weſt.

MOSPURG, or MOSBURG, a town of Germany, in the circle of Bavaria, ſituated at the confluence of the rivers Iſer and Amburg, thirty miles north-eaſt of Munich.

MOSQUE, a temple, or place of religious worſhip, among the mahometans.

All moſques are ſquare buildings, generally built with ſtone; before the chief gate there is a ſquare court, paved with white marble, and low galleries round it, whoſe roof is ſupported by marble pillars. In theſe galleries the Turks waſh themſelves before they go into the moſque. In each moſque there is a great number of lamps; and be-

tween these, hang many crystal rings, ostriches eggs, and other curiosities, which, when the lamps are lighted, make a fine shew. As it is not lawful to enter the mosques with shoes or stocking on, the pavements are covered with pieces of stuff sewed together, each being wide enough to hold a row of men kneeling, sitting, or prostrate. The women are not allowed to enter the mosque, but stay in the porches without. About every mosque there are six high towers, called minarets, each of which has three little open galleries, one above another: these towers, as well as the mosques, are covered with lead, and adorned with gilding and other ornaments; and from thence, instead of a bell, the people are called to prayer by certain officers appointed for that purpose. Most of the mosques have a kind of hospital belonging to them, in which travellers, of what religion soever, are entertained during three days. Each mosque has also a place called Tarbé, which is the burying-place of its founders: within which is a tomb six or seven feet long, covered with green velvet or sattin, at the ends of which are two tapers, and round it several seats for those who read the koran, and pray for the souls of the deceased.

MOSS, *muscus*, in botany, a very numerous order of plants, belonging to the cryptogamia class, the fructification of which is but little understood. Linnæus, indeed, has attempted to arrange them according to what he takes to be the parts of generation, many of which he acknowledges to be wanting. Hence in the description of such imperfect plants, it becomes necessary to distinguish them according to their general habit and structure.

Mosses, therefore, may be arranged under the following subdivisions, 1. Such as consist of tender flexible filaments, as byssus and conferva. 2. Such as consist of a mere foliaceous or gelatinous matter, as phyllona, ulva, *&c.* 3. Such as consist of firm and somewhat rigid stalks, as usnea, platysma, *&c.* 4. Such as consist merely of a dry, crustaceous, or else of a gelatinous matter, as placodium. 5. Such as produce capsules, covered with opercula, as bryum, polytrichum, sphagnum, mnium, *&c.* 6. Such as produce capsules without pedicles, and without calyptræ, as lycopodium, trispermium, selago, *&c.* 7. Such as consist of foliaceous matter, with evident fructifications arising from it, as marchantia, jungermannia, anthoceros, *&c.* See BYSSUS, CONFERVA, *&c.*

Mosses are of considerable use in medicine; usnea is esteemed a good desiccative and astringent; the cup moss is recommended in the chin cough; the grey ground-lichen, or liverwort, against the bite of a mad-dog; and other species, in other disorders, as mentioned under their respective heads.

Moss is frequently very injurious to fruit-trees, which grow upon cold barren soils, or where they are so close planted as to exclude the free access of the air: the only remedy, in such cases, is to cut down part of the trees, and to plough up the ground between those left remaining; and in the spring-season, in moist weather, you should with an iron-instrument made a little hollow, the better to surround the branches of the trees, scrape off the moss, carrying it off the place; and by two or three times thus cleansing them, together with carefully stirring the ground, it may be entirely destroyed from the trees; but unless part of the trees are cut down, and the ground be well stirred, the rubbish of the moss will signify little.

If the trees are covered with moss, on account of the dryness of the ground, the proper remedy is to lay mud, from the bottom of a river or pond, pretty thick about their roots.

Moss is also a name given to boggy grounds in many parts of the kingdom. These consist of a turfy surface, below which is a black, moist, spongy earth, which being dug up with spades somewhat in the form of bricks, and dried, is what they call peats, used as fuel in several parts; and the upper scurf, being cut and dried, makes turfs, another coarser sort of fuel.

Wall-Moss, *bryum*, in botany. See the article BRYUM.

MOSTRA, in the italian music, a mark at the end of a line or space, to shew that the first note of the next line is in that place: and if this note be accompanied with a sharp or flat, it is proper to place these characters along with the mostra. Also if in a thorough-bass this first note have any cyphers, these cyphers should be put along with the mostra, at the end of the preceding staff. And, lastly, if the part change its cleff with the first note, the cleff ought to be marked

ed along with the moſtra, in the ſame manner.

The moſtra is of conſiderable uſe, eſpecially in quick motions, as it prepares the player for what is to follow.

MOSUL, or MOUSUL. See MOUSUL.

MOTACILLA, in ornithology, a numerous genus of birds, of the order of the paſſeres, diſtinguiſhed by a ſtraight beak, of a ſubulated figure, and a lacerated tongue.

To this genus belong the common wagtail, the wheat-ear, nightingale, redſtart, wren, &c. See the articles WAGTAIL, WHEAT EAR, &c.

MOTAZALITES, the name of a famous ſect among the mahometans, properly ſignifying ſeparatiſts.

The motazalites are not accounted orthodox muſſulmen, as they believe the alkoran to be created and not eternal; and beſides aſſert, that there are no attributes in God diſtinct from his eſſence.

MOTE, in law-books, ſignifies court or convention, as a ward-mote, burgh-mote, ſwain-mote, &c. See the article WARD-MOTE, &c.

MOTETTO, in the italian muſic, a ſort of church-muſic compoſed with much art and ingenuity, from one to eight parts, with or without inſtruments, and uſually accompanied with a thorough-baſs.

MOTH, *tinea*, or *phalæna*, in zoology. See the article PHALÆNA.

MOTHER, *mater*, a term of relation, denoting a woman who hath born a child. See the article DELIVERY.

The queen mother, is the ſame with what we call queen dowager. See QUEEN.

MOTHER is alſo uſed figuratively, to denote whatever gives origin to other things of the ſame kind: thus we ſay a mother-church, a mother-tongue or language, &c. See the articles CHURCH and LANGUAGE.

Fits of the MOTHER, in medicine, the ſame with what is otherwiſe called hyſterics. See the article HYSTERICS.

MOTION, is defined to be the continued and ſucceſſive change of place. See the article COMMUNICATION *of Motion*.

There are three general laws of motion. 1. That a body always perſeveres in its ſtate of reſt, or of uniform motion in a right line, till by ſome external force it be made to change its ſtate: for as body is paſſive in receiving its motion, and the direction of its motion, ſo it retains them, or perſeveres in them without any change, till it be acted on by ſomething external. From this law it appears, why we inquire not, in philoſophy, concerning the cauſe of the continuation of motion or reſt in bodies, which can be no other than their inertia; but if a motion begin, or if a motion already produced is either accelerated or retarded, or if the direction of the motion is altered, an inquiry into the power or cauſe that produces this change is a proper ſubject of philoſophy. 2. The ſecond general law of motion is, that the change of motion is proportional to the force impreſſed, and is produced in the right line in which that force acts. When a fluid acts upon a body, as water or air upon the vanes of a mill, or wind upon the ſails of a ſhip, the acceleration of the motion is not proportional to the whole force of thoſe fluids, but to that part only which is impreſſed upon the vanes or ſails, which depends upon the exceſs of the velocity of the fluid above the velocity which the vane or ſail has already acquired: for if the velocity of the fluid be only equal to that of the vane or ſail, it juſt keeps up with it, but has no effect either to advance or retard its motion. Regard muſt always be had to the direction in which the force is impreſſed, in order to determine the change of motion produced by it: thus, when the wind acts obliquely with reſpect to the direction of a ſhip, the change of her motion is firſt to be eſtimated in the direction of the force impreſſed; and thence, by a proper application of mechanical and geometrical principles, the change of the motion of the ſhip in her own direction is to be deduced. 3. The third general law of motion is, that action and re-action is equal, with oppoſite directions, and are to be eſtimated always in the ſame right line. Body not only never changes its ſtate of itſelf, but reſiſts by its inertia every action that produces a change in its motion: hence when two bodies meet, each endeavours to perſevere in its ſtate, and reſiſts any change; the one acquires no new motion, but what the other loſes in the ſame direction; nor does this laſt loſe any force, but what the other acquires; and hence, though by their colliſion, motion paſſes from the one to the other, yet the ſum of their motions, eſtimated in a given direction, is preſerved the ſame, and is unalterable by their mutual actions upon each other.

All motion may be conſidered abſolutely

or relatively. Abſolute or real motion, ſays Mr. Maclaurin, is when a body changes its place in abſolute ſpace; and relative motion, is when a body changes its place only with relation to other bodies.

From the obſervation of nature, every one knows that there is motion; that a body in motion perſeveres in that ſtate, till by the action of ſome power it is neceſſitated to change it; that it is not in relative or apparent motion in which it perſeveres, in conſequence of its inertia, but in real or abſolute motion. Thus the apparent diurnal motion of the ſun and ſtars would ceaſe, without the leaſt power or force acting upon them, if the motion of the earth was ſtopt; and if the apparent motion of any ſtar was deſtroyed by a contrary motion impreſſed upon it, the other celeſtial bodies would ſtill appear to perſevere in their courſe. See the article INERTIA.

To make this matter ſtill plainer, Mr. Martin obſerves, that ſpace is nothing but an abſolute and infinite void, and that the place of a body is that part of the immenſe void which it takes up or poſſeſſes: and this place may be conſidered abſolutely, or in itſe'f, in which caſe it is called the abſolute place of the body; or elſe with regard to the place of ſome other body, and then it is called the relative or apparent place of the body.

Now as a motion is only the change of place in bodies, it is evident that it will come under the ſame diſtinction of abſolute and relative or apparent. All motion is in itſelf abſolute, or the change of abſolute ſpace; but, when the motions of bodies are conſidered and compared with each other, then are they relative and apparent only: they are relative, as they are compared to each other; and they are apparent only, inſomuch that not their true or abſolute motion, but the ſum or difference of the motions only is perceivable to us.

In comparing the motions of bodies we may conſider them as moving both the ſame way, or towards contrary parts: in the firſt caſe, the difference of motion is only perceived by us; in the latter, the ſum of the motions. Thus, for example, ſuppoſe two ſhips, A and B, ſet ſail from the ſame port upon the ſame rhumb, and that A ſails at the rate of five miles per hour, and B at the rate of three: here the difference of the velocity (*viz.* two miles per hour) is that by which the ſhip A will appear to go from the ſhip B forwards, or the ſhip B will appear at A to go with the ſame velocity backwards, to a ſpectator in either reſpectively.

If the two ſhips, A and B, move with the ſame degree of velocity, then will the difference be nothing, and ſo neither ſhip will appear to the other to move at all. Hence it is, that though the earth is continually revolving about its axis, yet, as all objects on its ſurface partake of the ſame common motion, they appear not to move at all, but are relatively at reſt.

If two ſhips, A and B, with the degrees of velocity as above, meet each other, the one will appear to the other to move with the ſum of both velocities, *viz.* at the rate of eight miles per hour; ſo that in this caſe the apparent motion exceeds the true, as in the other it fell ſhort of it. Hence the reaſon why a perſon, riding againſt the wind, finds the force of it much greater than it really is, whereas, if he rides with it, he finds it leſs.

The reaſon of all theſe phænomena of motion will be evident, if we conſider we muſt be abſolutely at reſt, if we would diſcern the true or real motions of bodies about us. Thus a perſon on the ſtrand will obſerve the ſhips ſailing with their real velocity; a perſon ſtanding ſtill will experience the true ſtrength and velocity of the wind; and a perſon, placed in the regions between the planets, will view all their true motions, which he cannot otherwiſe do, becauſe in all other caſes the ſpectator's own motion muſt be added to or ſubtracted from that of the moving body, and the ſum or difference is therefore the apparent or relative motion, and not the true.

Motion is alſo either equable or accelerated.

Equable motion is that by which a body paſſes over equal ſpaces in equal times.

Accelerated motion is that which is continually augmented or increaſed, as retarded motion is that which continually decreaſes; and, if the increaſe or decreaſe of motion be equal in equal times, the motion is then ſaid to be equally accelerated or retarded.

Equable motion is generated by a ſingle impetus or ſtroke; thus the motion of a ball from a cannon is produced by the ſingle action of the powder in the firſt moment, and, therefore, the velocity it firſt ſets out with, would always continue the ſame, were it void of gravity; and

and to move in an unreſiſting medium; which, therefore, would be always equable, or ſuch as would carry it through the ſame length of ſpace in every equal part of time.

Hence we may determine the theorems for the expreſſions of the time (T) the velocity (V) and the ſpace (S) paſſed over in equable or uniform motion very eaſily thus:

If the time be given, or the ſame, the ſpace paſſed over will be as the velocity, *viz.* S : V; that is, with twice the velocity, twice the ſpace; with three times the velocity, three times the ſpace, will be paſſed over in the ſame time, and ſo on.

If the velocity be given, or remain the ſame, then the ſpace paſſed over will be as the time, *viz.* S : T; that is, it will be greater or leſs, as the time is ſo.

But if neither the time nor velocity be given or known, then will the ſpace be in the compound ratio of both, *viz.* S : T V. Hence, in general, ſince S : T V, we have $V : \frac{S}{T}$; that is, the velocity is always directly as the ſpace, and inverſely as the time. And alſo $T : \frac{S}{V}$; that is, the time is as the ſpace directly, and as the velocity inverſely; or, in other words, it increaſes with the ſpace, and decreaſes with the velocity.

If, therefore, in any rectangle, one ſide repreſent the time, and the other ſide the velocity, it is evident that the area of the ſaid rectangle will repreſent the ſpace paſſed over by an uniform motion in that time, and with that velocity.

Accelerated motion is produced by a conſtant impulſe of power which keeps continually acting upon the body, as that of gravity which produces the motion of falling bodies; which ſort of motion is conſtantly accelerated, becauſe gravity every moment adds a new impulſe, which generates a new degree of velocity; and, the velocity thus increaſing, the motion muſt be quickened each moment, or fall faſter and faſter, the lower it falls.

In like manner a body thrown perpendicularly upward, as a ball from a cannon, will have its motion continually retarded, becauſe gravity acts conſtantly upon it in a direction contrary to that given it by the powder; ſo that its velocity upwards muſt be continually diminiſhed, and ſo its motion as continually retarded, till at laſt it be all deſtroyed. The body has then attained its utmoſt height, and is for a moment motionleſs, after which it begins to deſcend with a velocity in the ſame manner accelerated, till it comes to the earth's ſurface. See the article ACCELERATION.

Since the momentum (M) of a body is compounded of the quantity of matter (Q), and the velocity (V), we have this general expreſſion M = Q V, for the force of any body A; and ſuppoſe the force of another body B be repreſented by the ſame letters in italics, *viz.* $M = \mathcal{Q}\mathcal{V}$.

Let the two bodies A and B in motion impinge on each other directly; if they tend both the ſame way, the ſum of their motions towards the ſame part will be $Q V + \mathcal{Q}\mathcal{V}$. But if they tend towards contrary parts, or meet, then the ſum of their motions towards the ſame part will be $Q V - \mathcal{Q}\mathcal{V}$; for ſince the motion of one of the bodies is contrary to what it was before, it muſt be connected by a contrary ſign. Or thus; becauſe, when the motion of B conſpires with that of A, it is added to it; ſo, when it is contrary, it is ſubducted from it, and the ſum or difference of the abſolute motions is the whole relative motion, or that which is made towards the ſame part. Again, this total motion towards the ſame parts, is the ſame both before and after the ſtroke, in caſe the two bodies A and B, impinge on each other; becauſe, whatever change or motion is made in one of thoſe bodies by the ſtroke, the ſame is produced in the other body towards the ſame part; that is, as much as the motion of B is increaſed or decreaſed towards the ſame part by the action of A, juſt ſo much is the motion of A diminiſhed or augmented towards the ſame part by the equal re-action of B, by the third law of motion.

In bodies not elaſtic, let x be the velocity of the bodies after the ſtroke (for, ſince we ſuppoſe them not elaſtic, there can be nothing to ſeparate them after colliſion; they muſt therefore both go on together, or with the ſame celerity). Then the ſum of the motions after colliſion will be $Q x + \mathcal{Q} x$; whence, if the bodies tend the ſame way, we have $Q V + \mathcal{Q}\mathcal{V} = Q x + \mathcal{Q} x$, or if they meet, $Q V - \mathcal{Q}\mathcal{V} = Q x + \mathcal{Q} x$; and accordingly $\frac{Q V + \mathcal{Q}\mathcal{V}}{Q + \mathcal{Q}} = x$, or $\frac{Q V - \mathcal{Q}\mathcal{V}}{Q + \mathcal{Q}} = x$.

If

If the body (B) (plate CLXXXIII. fig. 1. n° 1.) be at reſt, then $V=o$, and the velocities of the bodies after the ſtroke will be $\frac{QV}{Q+Q}=x$.

Thus if the bodies be equal (*viz.* $Q=Q$, *ibid.* n° 1.) and A with 10 degrees of velocity impinge on B at reſt; then $\frac{QV}{Q+Q}=\frac{10}{2}=5=x$. If $Q=Q$, and $V:V::10:6$ (*ib.* n° 2.) we have $\frac{QV+QV}{Q+Q}=\frac{16}{2}=8=x$, the velocity after the ſtroke.

If the bodies are both in motion, and tend the contrary way; then when $Q=Q$ (*ibid.* n° 3.) and $V=V$, it is plain $\frac{QV-QV}{Q+Q}=o=x$; that is, the bodies which meet with equal bulks and velocities, will deſtroy each other's motion after the ſtroke, and remain at reſt. If $Q=Q$ (*ibid.* n° 4.) but $V:V::6:14$, then $\frac{QV-QV-8}{Q+Q}=\frac{-8}{2}=-4=x$; which ſhews that equal bodies meeting with unequal velocities, they will, after the ſtroke, both go on the ſame way which the moſt prevalent body moved before.

If the velocity $\frac{QV\pm QV}{Q+Q}$ be multiplied by the quantities of matter Q and Q, we ſhall have $\frac{Q^2V\pm Q^2V}{Q+Q}=$ the momentum of A after the ſtroke; and $\frac{QVQ\pm Q^2V}{Q+Q}=$ the momentum B: therefore $QV-\frac{Q^2V\pm Q^2V}{Q+Q}=\frac{Q^2V\pm Q^2V}{Q+Q}$ $=\frac{QQ}{Q+Q}\times\overline{V\pm V}=$ the quantity of the motion loſt in A after the ſtroke, and conſequently is equal to what is gained in B, as may be ſhewn in the ſame manner.

But ſince a part of this expreſſion (*viz.* $\frac{QQ}{Q+Q}$) is conſtant, the loſs of motion will ever be proportional to the other part $V\pm V$. But this loſs or change of motion in either body is the whole effect, and ſo meaſures the magnitude or energy of the ſtroke. Wherefore any two bodies, not elaſtic, ſtrike each other with a ſtroke always proportionable to the ſum of their velocities $(V+V)$ if they meet, or to the difference of their velocities $(V-V)$ if they tend the ſame way.

Hence, if one body (B) be at reſt before the ſtroke, then $V=o$; and the magnitude of the ſtroke will be as V; that is, as the velocity of the moving body A; and not as the ſquare of its velocity, as many philoſophers, (*viz.* the Dutch and Italians) maintain.

In bodies perfectly elaſtic, the reſtituent power or ſpring by which the parts diſplaced by the ſtroke reſtore themſelves to their firſt ſituation, is equal to the force impreſſed, becauſe it produces an equal effect; therefore, in this ſort of bodies, there is a power of action twice as great as in the former non-elaſtic bodies, for theſe bodies not only ſtrike each other by impulſe, but likewiſe by repulſe, they always repelling each other after the ſtroke. But we have ſhewn that the force with which non-elaſtic bodies ſtrike each other is as $V\pm V$; therefore the re action of elaſtic bodies is the ſame; that is, the velocity with which elaſtic bodies recede from each other after the ſtroke, is equal to the velocity with which they approached each other before the ſtroke. Whence if x and y be the velocities of two bodies A and B, tending the ſame way, after the ſtroke, ſince $V-V=y-x$, we have $x+\overline{V-V}=y$; whence the motion of A after the ſtroke will be Qx, and that of B will be $Qx+QV-QV$; and the ſum of theſe motions will be equal to the ſum of the motions before the ſtroke, *viz.* $Qx+Qx+QV-QV=QV+QV$. Whence, by reducing the equation, it will be $Qx+Qx=QV-QV+2QV$; and $x=\frac{QV-QV+2QV}{Q+Q}=$ the velocity of the body A.

Again, the velocity of B is $x+V-V=\frac{QV-QV+2QV}{Q+Q}+V-V=\frac{2QV-QV+QV}{Q+Q}$. Here we ſuppoſe the bodies tend the ſame way before the ſtroke; and it is evident from the equation above, that ſo long as $QV+2QV$ is greater than QV, the velocity (x) of A after the ſtroke will be affirmative, or the body A will move the ſame way after the ſtroke as before; but when QV is greater than $QV+2VQ$, the velocity (x) will be negative, or the body A will be reflected back.

If

Fig. 1. MOTION.

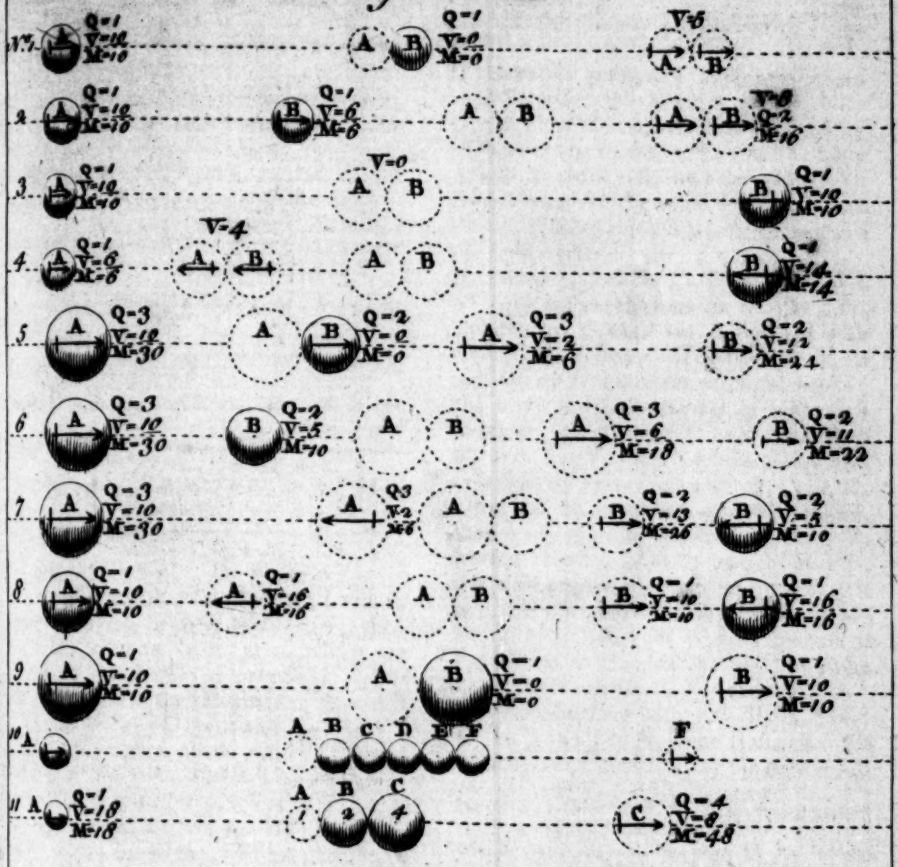
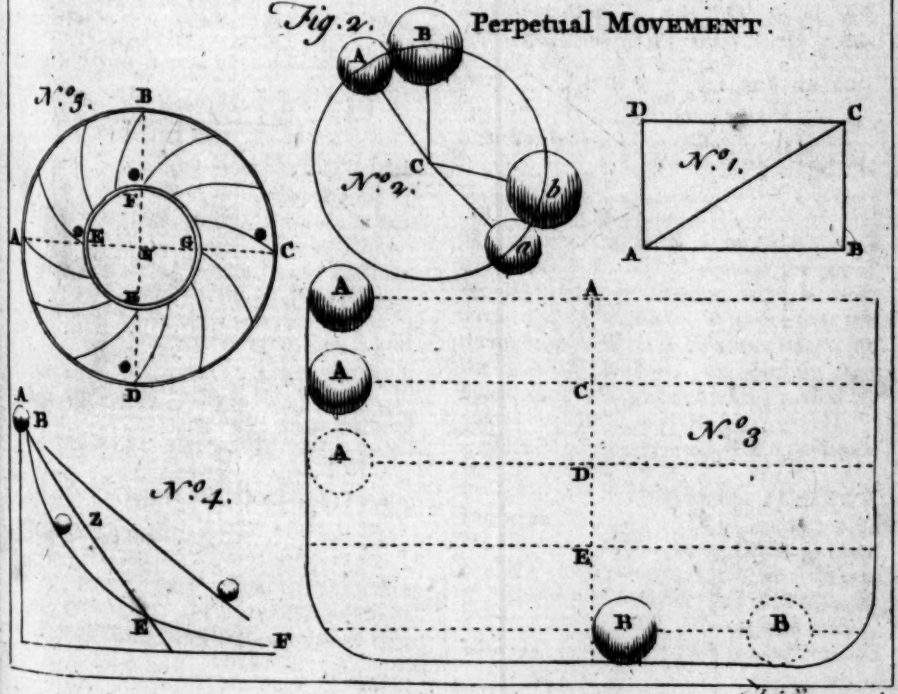
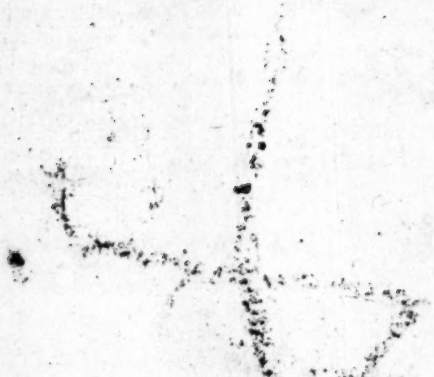


Fig. 2. Perpetual MOVEMENT.



J. Jeffrys sculp



BRITISH MUSEUM

If the body B be at reſt, then $V = o$; and $x = \frac{QV - 2V}{Q + 2}$, which ſhews the body A will go forwards or backwards, as QV is greater or leſſer than $2V$, or A greater or leſſer than B.

If $Q = 3$, $2 = 2$, $V = 10$, (*ibid.* n° 5.) and $V = o$; then after the ſtroke the velocity of A will be $x = \frac{QV - 2V}{Q + 2} = \frac{10 - 20}{5} = \frac{10}{-5} = 2$, and the velocity of B will be $y = \frac{2QV}{Q+2} = \frac{60}{5} = 12$. If the bodies are both in motion, and $V = 5$, the reſt is the ſame as before; then $\frac{QV - 2V + 2 2V}{Q + 2} = 6 =$ velocity of A (*ibid.* n° 6.) after the ſtroke, and $\frac{2QV - QV + 2V}{Q + 2} = 11 =$ velocity of B after the ſtroke.

If the bodies A and B move towards contrary parts, or meet each other, then will the relative velocity, to which the force of the ſtroke is proportional, be $V + V$; and ſo the velocities of A and B after the ſtroke will be x and $x + V + V$; and ſo the motion of A will be $Q x$ and $2x + 2V + 2V$; the ſum of theſe motions is $Qx + 2x + 2V + 2V = QV - 2V =$ the motion towards the ſame part before the ſtroke. Whence we have $x = \frac{QV - 2V - 2 2V}{Q + 2}$, and therefore the velocity of B will be $\frac{QV - 2V - 2 2V}{Q+2} + V + V = \frac{2QV + QV - 2V}{Q + 2}$.

If $QV + 2 2V$ be greater than QV, the motion of the body A will be backwards; otherwiſe it will go on forwards as before.

If $Q = 3$, $2 = 2$, $V = 10$, and $V = 5$; then will the velocity of A (*ibid.* n° 7.) be $\frac{QV - 2V - 2 2V}{Q + 2} = \frac{-10}{5} = -2$, and ſo the body A will go back with two degrees of velocity. The velocity of B, after the ſtroke, will be $\frac{2QV + QV - 2V}{Q+2} = 13$.

If the bodies are equal, that is, if $Q = 2$, (*ibid.* n° 8.) then $x = \frac{-2 2V}{2 2} = -V$; which ſhews, that when equal bodies meet each other, they are reflected back with interchanged velocities; for in that caſe alſo the velocity of B becomes $\frac{2QV}{2Q} = V$.

If the bodies are equal, and one of them at reſt, as B (*ibid.* n° 9.) then ſince $Q = 2$, and $V = o$, we have the velocity of A after the ſtroke $x = o$; or the body A will abide at reſt, and the velocity of B will be $= V$, the velocity of A before the impulſe, as appears by the example in the figure referred to.

If ſeveral bodies B, C, D, E, F, (*ibid.* n° 10.) are contiguous in a right line, and another equal body A ſtrike B with any given velocity, it ſhall loſe all its motion, or be quieſcent after the ſtroke; the body B which receives it will communicate it to C, and C to D, and D to E, and E to F; and becauſe action and re action between the bodies B, C, D, E, are equal, as they were quieſcent before, they muſt continue ſo; but the body F, having no other body to re-act upon it, has nothing to obſtruct its motion; it will therefore move on with the ſame velocity which A had at firſt, becauſe it has all the motion of A, and the ſame quantity of matter by hypotheſis.

Let there be three bodies A, B, C, (*ibid.* n° 11.) and let A ſtrike B at reſt; the velocity generated in B by the ſtroke will be $y = \frac{2QV}{Q+2}$, and ſo the momentum of B will be $\frac{2QV2}{Q+2} = 2y$. With this momentum B will ſtrike C at reſt and contiguous to it; the velocity generated in C will be $\frac{2 2y}{2+C}$; and its momentum will be $\frac{2 2yC}{2+C} = \frac{2QC}{2+C} \times \frac{2QV}{Q+2} = \frac{4QV2C}{Q2+QC+2^2+2C}$.

If now we ſuppoſe B a variable quantity, while A and C remain the ſame, we ſhall find what proportion it muſt have to each of them, in order that the momentum of C may be a maximum, or the greateſt poſſible, by putting the fluxion thereof equal to nothing; that is, $\frac{4Q^2C^2V\dot{2} - 4QC2^2\dot{2}}{(QC + Q2 + 2C + 2^2)^2} = o$; whence we get $QC - 2^2 = o$, and ſo $QC = 2^2$; conſequently $Q : 2 :: 2 : C$, or $A : B :: B : C$; that is, the body B is a geometrical mean between A and C. Hence if there be any number (n) of bodies in a geometrical ratio (r) to each other, and the firſt be A; the ſecond will be

rA,

rA, the third r^2A, and so on to the last, which will be $r^{n-1}A$.

Also, the velocity of the first being V, that of the second will be $\frac{2V}{1+r}$ (for $\frac{2QV}{Q+Q}$ is here $= \frac{2AV}{A+rA} = \frac{2V}{1+r}$) that of the third $\frac{4V}{1+r^2}$, that of the fourth $\frac{8V}{1+r^3}$, and so on to the last, which will be $\left(\frac{2}{1+r}\right)^{n-1}V$.

The momentum of the first will be AV, that of the second $\frac{2rAV}{1+r}$, that of the third $\frac{4r^2AV}{1+r^2}$, that of the fourth $\frac{8r^3AV}{1+r^3}$, and so on to the last, which will be $\left(\frac{2r}{1+r}\right)^{n-1}AV$.

To give an example of this theorem; if $n = 100$, and $r = 2$, then will the first body A be to the last $r^{n-1}A$, as 1 to 633825300000000000000000000000, nearly; and its velocity to that of the last nearly as 2710220000000000000101: lastly, the momentum of the first to that of the last will be nearly as 1 to 2338480000000.

If the number (n) of bodies be required, and the ratio of the momenta of the first and last be given as 1 to M, and the ratio of the series r given also; then, putting $\frac{2r}{1+r} = R$, we have the momentum of the last body expressed by $\left(\frac{2r}{1+r}\right)^{n-1} = M = R^{n-1}$; therefore the logarithm of M ($l.$ M) is equal to the logarithm of R ($l.$ R) multiplied by the power $n-1$; that is, $l.\,M = n-1 \times l.\,R$; consequently $\frac{l.\,M}{l.\,R.} + 1 = n$, the number of bodies required.

Perpetual MOTION, or MOVEMENT. See the article MOVEMENT.

Animal MOTION, is that whereby the situation, figure, magnitude, &c. of the parts, &c. of animals are changed: under these are comprized all the animal functions. See the article FUNCTION.

Animal motions are divided into spontaneous and natural.

Spontaneous or *muscular* MOTION, is that performed by the muscles at the command of the will. See MUSCLE.

Natural or *involuntary* MOTION, that effected, without any such command, by the mere mechanism of the parts, such as the motion of the heart, pulse, &c.

Intestine MOTION, the agitation of the particles of which a body consists.

Some philosophers will have every body and every particle thereof in continual motion. Hence intestine motion is represented to be a motion of the internal and smaller parts of matter, continually excited by some external latent agent, which only discovers itself by its effects, being appointed by nature as the great instrument of the changes in bodies.

MOTION, in astronomy, peculiarly denotes the orderly courses of the heavenly bodies.

The motions of the celestial luminaries are diurnal or common, and secondary or proper.

Diurnal or *primary* MOTION, is that wherein the whole mundane sphere appears to revolve every day round the earth from east to west. See the article DIURNAL.

This is called the motion of the primum mobile, and the common motion, to distinguish it from that peculiar to each planet, &c.

Secondary or *proper* MOTION, is that wherewith a star, planet, &c. advances a certain space every day from west towards east. See the article EARTH, &c.

MOTION, in music, the manner of beating the measure, to hasten or slacken the time of the words or notes. See TIME.

MOTIONS, in war, the marches, countermarches, &c. of an army in changing its post.

MOTIR, one of the Molucca-islands, subject to the Dutch: east long. 125°, north lat. 30′.

MOTOLA, a town of the kingdom of Naples, fifteen miles north-west of Taranto.

MOTORY NERVES, in anatomy, the third pair, joining to the eyes. See the article NERVES.

MOTOS, a term used by Galen for the finest kind of Cassia. See CASSIA.

The term motos likewise denotes lint to put into wounds, &c.

MOTRIL, a town of Spain, in the province of Granada, situated on the Mediterranean, forty miles south of the city of Granada.

MOTTO, in armoury, a ſhort ſentence or phraſe carried in a ſcroll, generally under, but ſometimes over the arms; ſometimes alluding to the bearing, ſometimes to the name of the bearer, and ſometimes containing whatever pleaſes the fancy of the deviſer. The motto, or word, ſays Guillim, is an ornament annexed to coat-armour; being the invention or conceit of the bearer ſuccinctly and ſignificantly expreſſed, uſually in three or four words, which are commonly ſet in ſome ſcroll or compartment, placed at the foot of the eſcutcheon. Our anceſtors made choice of ſuch mottos as expreſſed their predominant paſſions, as of piety, love, war, &c. or ſome extraordinary adventure that had befallen them: moſt of which have become hereditary in ſeveral families. The motto of the royal family of England is DIEU ET MON DROIT, *God and my right*: of the preſent king of France, ESPERANCE, *hope*: of the moſt noble order of the garter, HONI SOIT QUI MAL Y PENSE, *evil be to him that evil thinks*: of the dukes of Norfolk, SOLA VIRTUS INVICTA, *only virtue is invincible*; of the duke of Beaufort, MUTARE VEL TIMERE SPERNO, *I ſcorn to change or fear*: of the duke of Kingſton, PIE REPONE TE, *reſt in piety*, in alluſion to his name of Pierpoint.

MOTU. See EX MERO MOTU.

MOVEABLE, in general, denotes any thing capable of being moved.

The moveable feaſts are ſuch as are not regularly held on the ſame day of the year or month, though they are always on the ſame day of the week. Thus Eaſter, which is that moveable feaſt on which all the reſt depend, is held on the Sunday which falls upon, or next after, the firſt full moon following the 21ſt of March; and all the other feaſts keep a regular and certain diſtance from it: ſuch as Septuageſima, Sexageſima, Aſhwedneſday, Aſcenſion-day, &c. which ſee under their proper articles.

The moveable terms are Eaſter term, and Trinity term. See TERMS.

MOVEABLE GOODS, in law, ſuch chattels as are capable of being removed from one place to another, as cattle, merchandize, &c. See the article CHATTELS.

MOVEMENT, in mechanics, a machine that is moved by clock-work; for the theory of which, ſee the articles CLOCK, WATCH, &c.

To make a regular movement, that may ſerve to meaſure time as exactly as poſſible, is one of the moſt valuable problems in mechanics, which has been moſt ſucceſsfully effected, hitherto, by adapting pendulums to clocks: though it muſt be owned, ſays Mr. Maclaurin, that many ingenious contrivances have been invented to correct the irregularities of thoſe movements that go by ſprings.

Perpetual MOVEMENT. Some have attempted to find a perpetual movement, but without ſucceſs; and there is reaſon to think, from the principles of mechanics, that ſuch a movement is impoſſible: for though in many caſes of bodies acting upon one another, there is a gain of abſolute motion; yet the gain is always equal in oppoſite directions, ſo that the quantity of direct motion is never increaſed.

To make a perpetual movement it appears neceſſary, that a certain ſyſtem of bodies, of a determined number and quantity, ſhould move in a certain ſpace for ever, and in a certain way and manner: and for this there muſt be a ſeries of actions returning in a circle, otherwiſe the movement will not be perpetual; ſo that any action by which the abſolute quantity of force is increaſed, of which there are ſeveral ſorts, muſt have its correſponding counter-action, by which the gain of force is deſtroyed, and the quantity of force reſtored to its firſt ſtate. See the article FORCE.

Thus, by theſe actions, there will never be any gain of direct force, to overcome the friction and the reſiſtance of the medium; ſo that every motion being diminiſhed by theſe reſiſtances, they muſt at length languiſh and ceaſe.

To illuſtrate this, it is allowed, that, by the reſolution of force, there is a gain or increaſe of the abſolute quantity of force: thus, the two forces A B + B C (plate CLXXXIII. fig. 2. n° 1.) exceed the force A C, which is reſolved into them. But you cannot proceed reſolving motion in infinitum, by any machine whatſoever; but thoſe you have reſolved muſt be again compounded, in order to make a continual movement; and the gain, obtained by the reſolution, will be loſt again by the compoſition.

In like manner, if you ſuppoſe A and B (*ibid.* n° 2.) to be perfectly elaſtic bodies, and that the leſſer body A ſtrikes the greater one B quieſcent, there will be an increaſe of the abſolute quantity of force, becauſe A will be reflected; but if you ſuppoſe them both to turn round any center C, after the ſtroke, ſo as to meet

again in *a* and *b*, this increaſe of force will be loſt, and their motion reduced to its firſt quantity. Such a gain therefore of force, as muſt be afterwards loſt in the actions of bodies, can never produce a perpetual movement.

There are various ways beſides theſe, by which abſolute force may be gained; but ſince there is always an equal gain in oppoſite directions, and no increaſe obtained in the ſame direction, this gain muſt be preſently loſt in the circle of actions neceſſary to make a perpetual movement.

Some authors propoſe to make a perpetual movement upon theſe principles: let the height A B (*ibid.* n° 3.) be divided into four equal parts A C, C D, D E, E B: then ſuppoſe the body A to acquire, by the deſcent A B, a velocity as 1, and this motion by any contrivance to be tranſmitted to an equal body B; then let the body A, by an equal deſcent C D, acquire another motion as 1, to be tranſmitted likewiſe to the ſame body B, which in this manner is ſuppoſed to acquire a motion as 2, that is ſufficient to carry it upwards from B to A; and becauſe there yet remains the motion which A acquires by the deſcents D E and E B, that may be ſufficient to keep an engine in motion, while B and A aſcend and deſcend by turns. Thus, they raſhly conclude, that a ſufficient gain of force may be obtained in this manner, to produce a perpetual movement; for it is demonſtrable from the principles of motion, that a motion as 2 cannot be produced in B by the two ſucceſſive impulſes tranſmitted from A, each of which is as 1.

Others have propoſed projects for producing a perpetual movement, with a deſign to refute them; but by miſtaking the proper anſwer, have rather confirmed the unſkilful in their groundleſs expectations. An inſtance of this we have in Dr. Wilkin's mathematical magic, B. II. c. 13. where a loadſtone at A (*ibid.* n° 4.) is ſuppoſed to have a ſufficient force to bring up a heavy body along the plane F A, from F to B; whence the body is ſuppoſed to deſcend by its gravity, along the curve B E F till it return to its firſt place F; and then to riſe again along the plane F A, and deſcend along the curve B E F, continually. But ſuppoſing B Z E to be the ſurface upon which if a body was placed, the attraction of the loadſtone and the gravity of the body would balance each other; this ſurface muſt meet B E F at ſome point E, between A and F; ſo that when it comes to the point E, it muſt of courſe be ſtopped, and an end put to the motion.

What ſeems to promiſe the poſſibility of ſuch a movement, is this, *viz.* that the momenta of equal bodies are as their diſtances from the center of motion. Hence, ſay the perpetual motion men, if a wheel were conſtructed of the form of that in the figure A B C D (*ibid.* n° 5.) with circular cells going from the inner part E F G H to the outer, containing equal balls, C, D, E, F; then upon turning the wheel they muſt move towards the center N on one part, as the ball E; and from it on the oppoſite part, as the ball C; and by this means the ball C will have a greater momentum than the ball F, and ſo will determine the wheel to move round; and ſince this muſt be the caſe of all the balls E and C that come into the ſituation E C, the wheel muſt neceſſarily move continually, becauſe it will bring two balls into that ſituation. It is true, were there but two balls E and C, the ball C would by this contrivance move the wheel ¼ round, *viz.* while it deſcended from C to D; and by this means would raiſe the ball E to F, and there they will abide in the ſituation D F; but, ſay the men of this perſuaſion, two other balls, ſucceeded to the places E and C, will ſtill keep the wheel moving. Yes, ſo they would, if the balls at D and E could be taken away the moment they come into that poſition; not elſe, for the balls C and E, in order to move the wheel, muſt move the balls D and F, which have equal momenta (as being at the ſame diſtance each from the center, as are the other two reſpectively) which is abſurd by the general propoſition.

The abſurdity of a perpetual motion will ſtill farther appear, if we conſider that the momenta of bodies are always proportioned to the perpendicular deſcent or aſcent to or from the center of the earth. Since, therefore, in the wheel the bodies are all equal by ſuppoſition, and the perpendicular ſpaces through which they deſcend and aſcend, above and below the horizontal line or diameter A C, are equal; it follows, that an equilibrium muſt neceſſarily enſue. Thus, ſo far is this wheel from producing a perpetual motion, that it admits of none at all.

MOULD, or MOLD, in the mechanic arts, &c.

&c. a cavity cut with a deſign to give its form or impreſſion to ſome ſofter matter applied therein, of great uſe in ſculpture, foundery, *&c.*

The workmen employed in melting the mineral or metallic glebe dug out of mines, have each their ſeveral moulds to receive the melted metal as it comes out of the furnace; but theſe are different according to the diverſity of metals and works. In gold-mines they have moulds for ingots; in ſilver-mines, for bars; in copper and lead mines, for pigs or ſalmons; in tin-mines, for pigs and ingots; and in iron-mines, for ſaws, chimney-backs, anvils, caldrons, pots, and other large utenſils and merchandizes of iron, which are here caſt as it were at firſt hand.

The MOULDS *of founders*, for large works, as ſtatues, bells, guns, as alſo thoſe for ſmall works, may be ſeen under the article FOUNDERY.

The MOULDS *of moneyers*, are frames full of ſand wherein the plates of metal are caſt that are to ſerve for the ſtriking of ſpecies of gold and ſilver. See the article COINING.

MOULDS, in the manufacture of paper, are little frames compoſed of ſeveral braſs or iron-wires, faſtened together by another wire ſtill finer. Each mould is of the bigneſs of the ſheet of paper to be made, and has a rim or ledge of wood to which the wires are faſtened; theſe moulds are more uſually called frames, or forms.

Furnace and crucible-makers MOULDS, are made of wood, of the ſame form with the crucibles; that is, in form of a truncated cone: they have handles of wood to hold and turn them with, when, being covered with the earth, the workman has a mind to round or flatten his veſſel.

MOULDS *for leaden bullets*, are little iron-pincers, each of whoſe branches terminates in an hemiſpherical concavity, which when ſhut, form an intire ſphere: in the lips or ſides where the branches meet, is a little jet or hole through which the melted lead is conveyed.

Glaziers-MOULDS. The glaziers have two kinds of moulds, both ſerving to caſt their lead. In the one they caſt the lead into long rods or canes fit to be drawn through the vice, and the grooves formed therein: this they ſometimes call ingot-mould. In the other they mould thoſe little pieces of lead a line thick, and two lines broad, faſtened to the iron-bars: theſe may be alſo caſt in the vice.

Goldſmiths-MOULDS. The goldſmiths uſe the bones of the cuttle-fiſh to make moulds for their ſmall works, which they do by preſſing the pattern between two bones, and leaving a jet or hole to convey the ſilver through, after the pattern has been taken out.

MOULD, among maſons, a piece of hard wood or iron hollowed withinſide, anſwerable to the contours of the mouldings or cornithes, *&c.* to be framed: this is otherwiſe called caliber.

MOULDS, among plumbers, are the tables whereon they caſt the ſheets of lead. Theſe they ſometimes call ſimple tables: beſides which they have other real moulds wherewith they caſt pipes without ſoldering. See the article PLUMBERY.

MOULDS, among grinders of optic-glaſſes. See the article GRINDING.

MOULDS, uſed in baſket-making are very ſimple, conſiſting ordinarily of a willow, or oſier, turned or bent into an oval, circle, ſquare, or other figure, according to the baſkets, panniers, hampers, hats, and other utenſils intended. On theſe moulds they make or more properly meaſure all their work, and accordingly they have them of all ſizes, ſhapes, *&c.*

MOULDS, among tallow-chandlers, are of two kinds: the firſt for the common dipped candles, being the veſſel wherein the melted tallow is diſpoſed, and the wick dipped: this is of wood, of a triangular form, and ſupported on one of its angles, ſo that it has an opening of near a foot at top: the other, uſed in the fabric of mould candles, is of braſs, pewter, or tin; here each candle has its ſeveral moulds. See the article CANDLE.

MOULD, among gold-beaters, a certain number of leaves of velom, or pieces of guts, cut ſquare, of a certain ſize, and laid over one another, between which they put the leaves of gold and ſilver, which they beat on the marble with the hammer. They have four kinds of moulds, two whereof are of velom, and two of gut; the ſmalleſt of thoſe of velom conſiſts of forty or fifty leaves, the largeſt contains an hundred: for the others, each contains five hundred leaves. The moulds have all their ſeveral caſes, conſiſting of two pieces of parchment, ſerving to keep the leaves of the mould in their place, and prevent their being diſordered in beating.

MOULD, in agriculture, a looſe kind of earth, every where obvious on the ſur-

face of the ground, called alſo natural or mother-earth; by ſome alſo loam. See the article EARTH.

The goodneſs of a mould for the purpoſes of gardening, &c. may be known, according to Miller, by the ſight, ſmell, and touch. 1. Thoſe moulds that are of a bright cheſnut or hazelly colour, are counted the beſt: of this colour are the beſt loams, and alſo the beſt natural earth; and this will be the better yet, if it cut like butter, and does not ſtick obſtinately, but is ſhort, tolerably light, breaking into ſmall clods, is ſweet, will be tempered without cruſting or chopping in dry weather, or turning to mortar in wet. Next to that the dark grey and ruſſet moulds are accounted the beſt: but the light and dark aſh-coloured the worſt, ſuch as is uſually found on common heathy ground: the clear tawney is by no means to be approved; but that of a yellowiſh red colour is the worſt of all: this is commonly found in wild and waſte parts of the country, and for the moſt part produces nothing but goſs, furze, and fern, according as their bottoms are more or leſs of a light and ſandy, or of a ſpewey, gravel, or clayey nature. 2. All lands that are good and wholeſome, will, after rain, or breaking up by the ſpade, emit a good ſmell. 3. By the touch we may diſcover whether it conſiſts of ſubſtances entirely arenaceous, or clammy; or, as it is expreſſed by Mr. Evelyn, whether it be tender, fatty, deterſive, or ſl ppery; or more harſh, gritty, porous, or friable.

MOULDINESS, a term applied to bodies which corrupt in the air, from ſome hidden principle of humidity therein; and whoſe corruption ſhews itſelf by a certain white down, or lanugo, on their ſurface, which, viewed through a microſcope, appears like a kind of meadow, out of which ariſe herbs and flowers, ſome only in the bud, others full blown, and others decayed, each having its root, ſtalk, and other parts. See the articles CORRUPTION and VEGETATION.

MOULDING, any thing caſt in a mould, or that ſeems to have been ſo, though in reality it were cut with a chiſſel, or the ax. Moulding of figures in paſte is done as follows: take the crumb of a new drawn white loaf, beat it, and roll it with a rolling-pin as fine and as far as it will go; then print it on the moulds: and when it has taken the ſuitable figure you deſire, dry it in a ſtove, and it will be very hard: and to preſerve it from vermin, you may mix a little powder of aloes with it. To mould ſmall figures of jaſper-colour: oil your moulds with a fine pencil, and diverſify them with ſuch colours as you pleaſe, with gum-tragacanth; if they ſpread or run, put a little of the gall of an ox, for the thicker it is, the harder it will be: then mould your paſte of the colour of jaſper, or the like; put it in to fill the mould; tie it with a wire, and take it out; repair and varniſh it, and ſet it to harden.

MOULDINGS, in architecture, projectures beyond the naked wall, column, wainſcot, &c. the aſſemblage of which forms corniches, door-caſes, and other decorations of architecture. See pl. CLXXXI. fig. 4.

Some mouldings are ſquare, others round, ſome are ſtraight, others curved, &c. and ſome are plain, others carved, or adorned with ſculpture, either hollowed or in relievo: ſome again are crowned with a fillet, others are without, as the doucine, talon, ovolo, torus, ſcotia, aſtragal, gula, corona, &c. See the articles DOUCINE, &c.

Mouldings are in architecture, what letters are in writing; by the various diſpoſitions and combinations of mouldings may be made an infinite number of different profiles, for all ſorts of orders and compoſitions, regular or irregular; and yet all the kinds of mouldings may be reduced to three, *viz.* ſquare, round, and mixed, *i. e.* compoſed of the other two. For this reaſon, thoſe who invented the gothic architecture, reſolving to recede from thoſe perfect figures, and affecting to uſe others leſs perfect, to diſtinguiſh their architecture from the antique, introduced a new ſet of whimſical mouldings and ornaments. Regular mouldings are either large, as doucines, ovolos, gulas, talons, ſcotias, &c. or ſmall, as fillets, aſtragals, conges, &c.

MOULIN, or *Fer de* MOULIN. See the article FER.

MOULINS, a city of France, in the province of Lionois, and dutchy of Bourbon, ſituated forty-ſeven miles ſouth-eaſt of Bourges.

MOULINET, is uſed, in mechanics, to ſignify a roller, which being croſſed with two levers, is uſually applied to cranes, capſtans, and other ſorts of engines of the like nature, to draw ropes, and heave up ſtones, &c.

MOULINET is alſo a kind of turnſtile, or wooden croſs, which turns horizontally upon

upon a ſtake fixed in the ground; uſually placed in paſſages to keep out horſes, and to oblige paſſengers to go and come one by one. Theſe moulinets are often ſet near the outworks of fortified places at the ſides of the barriers, through which people paſs on foot.

MOULTING, or MEWING. See the article MEWING.

MOUND, a term uſed for a bank or rampart, or other fence, particularly that of earth.

MOUND, in heraldry, a ball or globe with a croſs upon it, ſuch as our kings are uſually drawn with, holding it in their left hands, as they do the ſceptre in the right.

MOUNT, an elevation of earth, called alſo mountain. See MOUNTAIN.

Saint Catharine of MOUNT *Sinai*. See the article CATHARINE.

Knights of MOUNT *Carmel*. See the article CARMELITES.

MOUNT-CASSEL, a town of the french Netherlands, in the province of Flanders, ſituated fifteen miles ſouth-weſt of Ypres.

MOUNT ST. MICHAEL, a borough-town of Cornwal, ſituated on a bay of the Engliſh channel, called Mountſbay, eighteen miles weſt of Falmouth.

It ſends two members to parliament.

MOUNT ST. MICHAEL is alſo a fortreſs of France, in the province of Normandy, ſituated on a rock in the Engliſh channel, twenty miles eaſt of St. Malo.

MOUNT-SORREL, a market-town of Leiceſterſhire, ſeven miles north of Leiceſter.

MOUNT-EGG. In the tin-works, after the tin from the burnt ore is melted down and remelted, there will ſometimes remain a different ſlug in the bottom of the float; this they call mount-egg: and though of a tin-colour, yet is of an iron-nature, as has been found by applying a magnet to it.

MOUNT *of Piety*, certain funds or eſtabliſhments in Italy, where money is lent out, on ſome ſmall ſecurity. We had alſo mounts of piety in England, raiſed by contribution, for the benefit of people ruined by the extortions of the Jews.

MOUNTAIN, *mons*, a part of the earth, riſing to a conſiderable height above the level of the ſurface thereof.

The origin of mountains is variouſly aſſigned by philoſophers: ſome will have them coeval with the world, and created along with it; others, among whom is Dr. Burnet, will have them to take their riſe from the deluge, urging that the extreme irregularity and diſorder viſible in them, plainly ſhews they do not come immediately out of the hand of God, but are the wrecks of the old world, broken into the abyſs. See DELUGE.

Others, again, alledge from hiſtory, that the roots of many hills being eaten away, the hills themſelves have ſubſided and ſunk into plains; whence they conclude, that where the corruption is natural, the generation is ſo too. It appears certain to many, that ſome mountains muſt have been generated gradually, and have grown up in proceſs of time, from the ſea-ſhells, *&c.* found in them, which they ſuppoſe may be accounted for, from a violent wind blowing the ſand, *&c.* into huge heaps, which were made into a maſs by the rain, *&c.* The origin of mountains in the opinion of Mr. Ray, ſeems to have been from exploſions, by means of ſubterraneous fires; and he thinks it very probable, that they all have vaſt hollows beneath them; and that this might have been the means uſed at the creation, to make the dry land appear, he thinks no way diſſonant to reaſon, ſince hiſtory proves that fires have raged in ſubterraneous caverns under the ſeas; and there is no natural impoſſibility in fire's ſubſiſting in ſuch caverns, even when the earth was all over covered with water, as at the firſt creation.

Mountains appear to many, defects and blemiſhes in the earth; but they are truly of the utmoſt uſe and neceſſity to the well-being both of man and other animals. They ſerve as ſcreens to keep off the cold and nipping blaſts of the northern and eaſtern winds; they ſerve for the production of a great number of vegetables and minerals, which are not found in any other ſoil; the long ridges and chains of lofty and topping mountains being generally found to run from eaſt to weſt, ſerve to ſtop the evagation of the vapours towards the poles, without which they would all run from the hot countries, and leave them deſtitute of rain. Mr. Ray adds, that they condenſe theſe vapours, like alembic heads, into clouds, and ſo, by a kind of external diſtillation, give origin to ſprings and rivers; and, by amaſſing, cooling, and conſtipating them, turn them into rain, and by that means render the fervid region of the torrid zone habitable. He farther adds, that many creatures cannot live but in particular ſituations, and even the tops of the higheſt

and

and the coldeſt mountains are the only places where ſome creatures, as well birds as quadrupeds, will live; of this kind are the ibex and chamois among beaſts, and the lagopus among birds. See the articles IBEX, &c.

To meaſure the height of a mountain, the ſame method muſt be uſed as is done in meaſuring any other inacceſſible height. See the article HEIGHT.

There is another method propoſed for taking the height of a mountain, by means of the barometer: thus, it is to be obſerved, how many inches or parts of inches, the quickſilver is depreſſed, at the top of the mountain we have a mind to meaſure, below the altitude it hath acquired, at the ſame time, at the bottom or ſuperficies of the ſea; for hence the true height of the mountain may be found, from an eſtabliſhed proportion. In order to diſcover the height of a mountain, or that of any other thing, Dr. Halley, from barometrical obſervations, on Snowden-hill, concludes that the quickſilver deſcends a tenth of an inch every thirty yards of aſcent: and Dr. Derham, by good obſervations on the Monument of London, reckons eighty two feet for every tenth of an inch; but, by very nice obſervations which he afterwards made with excellent inſtruments, at divers altitudes, in St. Paul's dome, and when the barometer was at a different height, he found, at near ninety feet, the quickſilver ſunk one tenth, and at ſomewhat leſs than double and treble that height, two tenths, and three tenths, &c. according to Dr. Halley's and Mr. Caſſini's tables. See the article BAROMETER.

To meaſure the height of a lunar mountain is a curious problem, and, at the ſame time, very eaſy to effect in the following manner. Let C (plate CLXXXII. fig. 8.) be the moon's center, E D B a ray of the ſun touching the moon's ſurface in D, and the top of a mountain in B. Draw C B and C D; the height of the mountain A B is to be found. With a micrometer in a teleſcope, find what proportion the diſtance of the top of the mountain B, from the circle of illumination at D, bears to the diameter of the moon, that is, the proportion of the line D B to D F; and becauſe D F is known in miles, D B will be alſo known in that meaſure.

Now admit that D B : D C :: 1 : 8, as in one of the hills it will be; then $\overline{DC^2} + \overline{DB^2} = 64 + 1 = 65 = \overline{CB^2}$; whence $\sqrt{65} = 8.062 = BC$; wherefore BC — AC = 8.062 — 8 = 0.062 = AB, the height of the mountain required. Wherefore, AC : AB :: 8 : 0.062 :: 8000 : 62. And, ſince the moon's ſemidiameter AC = 1096 miles, therefore 8000 : 62 :: 1096 : 8.5 nearly. This mountain then, being 8½ miles high, is near three times higher than the higheſt mountain on the earth.

Burning MOUNTAIN. See VULCANO.

Cat of the MOUNTAIN, in zoology. See the article CAT.

Cock of the MOUNTAIN, in zoology. See the article UROGALLUS.

MOUNTING, in the mechanic arts, ſomething that ſerves to raiſe or ſet off a work: thus, the frame and its dependences make the mounting of a looking-glaſs; the hilt, the mounting of a ſword; the fuſt, or but, the mounting of a carbine, muſquet, &c. and the mounting of a fan, is the ſticks which ſerve to open and ſhut it.

MOUNTING, in military affairs, ſignifies going upon duty: thus, mounting a breach, is running up to it; mounting the guard, is going upon guard; and mounting the trenches, is going upon duty in the trenches; but mounting a cannon, mortar, &c. is the ſetting it on its carriage, or the raiſing its mouth.

MOUREMANSKOY, the north-weſt part of ruſſian Lapland, in Europe.

MOURNERS, an order of penitents in the antient chriſtian church, who lay proſtrate in the porches of churches, begging the prayers of the faithful, as they went in, and deſiring to do public penance in the church. See the article PENITENTS.

MOURNING, among the antients, was expreſſed by very different ſigns, as by tearing their cloaths, wearing ſackcloath, laying aſide crowns and the other enſigns of honour: thus Plutarch, in his Life of Cato, relates, that from the time of his leaving the city with Pompey, he neither ſhaved his head, nor, as uſual, wore the crown, or garland. A public grief was ſometimes teſtified by a general faſt. Among the Romans, a year of mourning was ordained, by law, for women who had loſt their huſbands. In public mournings, the ſhops of Rome were ſhut up; the ſenators laid aſide their laticlavian robes; the conſuls ſat in a lower ſeat than uſual; and the women laid aſide all their ornaments. The antients had a remarkable way of mourning

ing for ſoldiers ſlain in battle; the whole army attended the funeral ſolemnities, with their arms and ſhields turned upſide down. See the article FUNERAL.

The mournings of the eaſtern nations of Indians are much more cloſely followed, though of much ſhorter duration than ours. After the death of a near relation, they mourn fifteen days, during which time they eat nothing but rice and water: they are not to chew betle, or to uſe the common waſhings; but are to perform acts of charity, ſuch as diſtributing food to the poor; and prayers are ſaid, intreating the almighty to forgive the ſins of the deceaſed, and to aſſign him a good place in the other world. On the ſixteenth day, when the mourning is ended, they make a ſolemn feaſt, according to their abilities, and invite to it all their friends and neighbours. After this they annually, on the ſame day, give food to the poor, and renew their prayers for the happineſs of the dead perſon.

The colours of the dreſs or habit worn to ſignify grief, are different in different countries. In Europe, the ordinary colour for mourning is black; in China, it is white, a colour that was the mourning of the antient ſpartan and roman ladies; in Turky, it is blue, or violet; in Egypt, yellow; in Ethiopia, brown; and kings and cardinals mourn in purple. Every nation and country give a reaſon for their wearing the particular colour of their mourning: black, which is the privation of light, is ſuppoſed to denote the privation of life; white is an emblem of purity; yellow is to repreſent, that death is the end of all human hopes, becauſe this is the colour of leaves when they fall, and flowers when they fade; brown denotes the earth, to which the dead return; blue is an emblem of the happineſs which it is hoped the deceaſed enjoys; and purple, or violet, is ſuppoſed to expreſs a mixture of ſorrow and hope.

MOUSE, in zoology, a ſpecies of mus, with a long and almoſt naked tail, and a white belly. See the article MUS.

It is common every where in houſes and fields.

MOUSE-EAR, *myoſotis*, in botany. See the article MYOSOTIS.

MOUSE-TAIL, *myoſurus*. See the article MYOSURUS.

Dor-MOUSE, *ſorex*. See SOREX.

Sea MOUSE, *aphrodita*. See the article APHRODITA.

MOUSEL, or MOSUL, a city of aſiatic Turky, in the province of Diarbec, or Meſopotamia, ſituated on the river Tigris, oppoſite the place where Nineveh ſtood: eaſt long. 43°, and north lat. 36°.

MOUTH, in anatomy, a part of the face, conſiſting of the lips, the gums, the inſides of the cheeks, the palate, the ſalival glands, the os hyoides, the uvula, and the tonſils, which ſee under their proper articles.

Mr. Derham obſerves, that the mouth in the ſeveral ſpecies of animals, is nicely adapted to the uſes of ſuch a part, and well ſized and ſhaped for the formation of ſpeech, the gathering and receiving of food, the catching of prey, *&c.* In ſome creatures it is wide and large, in others little and narrow; in ſome it is formed with a deep inciſure into the head, for the better catching and holding of prey, and more eaſy comminution of hard, large, and troubleſome food; and in others with a ſhorter inciſure, for the gathering and holding of herbaceous food. In birds, it is neatly ſhaped for piercing the air; hard and horny, to ſupply the want of teeth; hooked, in the rapacious kind, to catch and hold their prey; long and ſlender in thoſe that have their food to grope for in mooriſh places; and broad and long, in thoſe that ſearch for it in the mud. Nor is the mouth leſs remarkable in inſects: in ſome it is forcipated, to catch, hold, and tear the prey; in others aculeated, to pierce and wound animals and ſuck their blood; in others, ſtrongly rigid, with jaws and teeth, to gnaw and ſcrape out their food, carry burdens, perforate the earth, nay the hardeſt wood, and even ſtones themſelves, for houſes and neſts for their young.

MOUTH *of a horſe*, in the manege, ſhould be moderately well cloven; for when it is too large, it is difficult to bit a horſe, ſo as that he may not ſwallow it, as the horſemen term it; and if he has a ſmall mouth, it will be difficult to get the bit rightly lodged in it.

A horſe is ſaid to have a fine, ſenſible, tender, light, or loyal mouth, when he is ſo ſenſible in that part where the bit is placed, as to obey the leaſt motion of the bridle; ſo a falſe mouth is a mouth that is not at all ſenſible, though the parts look well, and are well formed; and a mouth is ſaid to be fixed and certain, when a horſe does not check or beat upon the hand. See the article HAND.

MOUTH is uſed in the courts of princes, for what relates to their eating and drink-

ing: hence officers of the mouth, yeomen of the mouth.

Opening and ſhutting the MOUTH *of a cardinal.* See the article CARDINAL.

MOUTON D'ORE, an antient french gold-coin, worth about twelve ſols ſix deniers: it was firſt ſtruck in the reign of St. Louis, and probably took its name from the figure of a lamb repreſented on one of its ſides.

MOXA, a ſort of cotton or downy ſubſtance ſeparated from the leaves of a ſort of indian mug-wort; uſed by the eaſtern nations for cauterizing in certain parts of the body. See the articles CAUSTICS, CAUTERIZATION, and CAUTERY.

The firſt cauſtic of this kind we find uſed, was by Hippocrates and the other antient phyſicians, to cauterize parts in pain. Some of the moderns wonderfully extol cauterization with moxa, as the moſt effectual means to cure, and wholly extirpate the gout: but for the art of cauterizing with it, Heiſter thinks it neceſſary to obſerve the following particulars, *viz.* in the firſt place, to make a ſmall cone of the moxa, about a thumb's breadth long, made after the ſame manner as thoſe commonly uſed for a ſuffitus; the baſis of this cone is to be ſtuck upon the part with gum arabic, or gum tragacanth, and its point is then to be fired by a candle, or burning coal; by which means not only the cone will be gradually conſumed, but the painful part will be at laſt cauterized, and thence the pain of the gout will frequently have ſome remiſſion; but if the pains do not entirely vaniſh at the firſt, a new cone is to be applied again to the part, and the cauterization thus continued till the pain ceaſes; but however this proceſs may have been cried up by many of the Europeans, it is at preſent quite in diſuſe, on account, that beſides the acute pain it cauſes, it is frequently found to have little or no effect.

MOYNEAU, or MOINEAU, in fortification. See the article MOINEAU.

MSCYSLAW, the capital of the palatinate of Mſcyſlaw, in Poland, ſituated on the frontiers of Muſcovy: eaſt long. 31° 30′, and north lat. 54° 34′.

MUCILAGE, in pharmacy, is in general any viſcid and glutinous liquor.

For the preparation of the mucilage of tragacanth, we muſt have four veſſels, either of delf-ware, or common earth, varniſhed. Into one of theſe put a dram and a half of white gum tragacanth, bruiſed; into another put half an ounce of the ſeeds of pſyllium; into another, three drams of quince-ſeeds; and in the fourth ſix drams of the root of marſh-mallows, well cleanſed, cut into ſmall portions and bruiſed: upon the gum tragacanth pour two ounces and a half of ſtrawberry-water, and as much of betony-water; then cover the veſſel, and place it over hot aſhes, for three or four hours, or till the gum is entirely melted and incorporated with the water; then the matter is to be paſſed through a proper ſearce.

In preparing the mucilage of flea-wort, or pſyllium, pour three ounces of ſtrawberry-water, and as much of betony-water, on the ſeeds of pſyllium; then cover the veſſel, and let the matter ſtand in infuſion over warm aſhes, for eight or ten hours: after which, boil the infuſion gently, and ſtrain it by expreſſion.

In making a mucilage of quinces, on the quince-ſeeds pour two ounces and a half of betony-water, and as much of the water of ſtrawberries: cover the veſſels, and leave the matter in fuſion, for eight or ten hours; after which heat the infuſion till it is almoſt ready to boil; then it is to be ſtrained by expreſſion.

MUCILAGE alſo denotes a thick pituitous matter, evacuated with the urine, in the gravel and dyſuria. See the articles STONE and DYSURY.

MUCILAGE alſo imports the liquor which principally ſerves to moiſten the ligaments and cartilages of the articulations; and is ſupplied by the mucilaginous glands. See the next article.

MUCILAGINOUS GLANDS, in anatomy, a very numerous ſet of glands, ſerving to ſecrete the mucilage of the joints. See GLAND, and the preceding article.

Theſe glands are commonly ſituated in the joint after ſuch a manner as to be gently preſſed, but not deſtroyed by its motion; by which means, when there is the greateſt neceſſity for the mucilage, that is, when the moſt frequent motions are performed, the greateſt quantity of it muſt be ſecreted. Theſe glands are ſoft and pappy, but not friable; they are moſtly of the conglomerate kind: their excretory ducts are long, and hang looſe like ſo many fringes, within the articulation, which, by its motion and preſſure, will prevent obſtructions in the body of the gland itſelf, or its excretories, and will promote the return of the mucilage, when

when fit to be taken up by the abſorbent veſſels; and at the ſame time the preſſure on the excretory ducts hinders a ſuperfluous excretion, while the fimbriated diſpoſition of theſe excretories will not allow any of the ſecreted liquor to be puſhed back again by theſe canals towards the glands.

MUCOCARNEOUS, a name whereby ſome authors call a ſort of abſceſſes, which are partly made up of fleſh, and partly of a thick mucous matter.

MUCOR, in botany, a genus of muſhrooms, being funguſes conſiſting of roundiſh little bladders, in which are found numerous ſeeds, affixed to hair-like receptacles, placed all over the inſide of the bladders.

MUCOUS GLANDS, in anatomy, three glands, which empty themſelves into the urethra; ſo called by their firſt diſcoverer, Mr. Cowper, from the tenacity of the liquor which they ſeparate.

The two firſt of theſe are about the bigneſs of a french-bean, of a depreſſed oval figure, and a yellowiſh colour, like the proſtates; being on each ſide the bulb of the cavernous body of the urethra, a little above it. Their excretory ducts ſpring from the internal ſurface, next the inner membrane of the urethra, into which they open a little lower, by two diſtinct orifices, juſt below its bending under the oſſa pubis, in perinæo, where they diſcharge a tranſparent viſcuous liquor. The third mucous gland is a ſmall, conglobate, yellowiſh gland like the former, but ſomewhat leſs, ſituated above the angle of the flexure of the urethra, under the oſſa pubis, in the perinæum, near the anus. It has two excretory ducts, which enter the urethra obliquely, a quarter of an inch below the two former, and diſcharges a liquor like them both in colour and conſiſtence.

MUCOUS FEVER, a term uſed by medical writers, to expreſs thoſe fevers, in which nature is endeavouring to rid herſelf of an abundance of pituitous, mucous, and ſerous matter. The catarrhal fevers of all ſorts are expreſſed under this denomination. See CATARRHAL FEVER.

MUCRO CORDIS, in anatomy, the lower or pointed end of the heart. See HEART.

MUCUS, a mucilaginous liquor ſeparated by the mucous glands, and the noſtrils. See the articles MUCOUS GLANDS, NOSTRILS, and GLAND.

The mucus of the urethra is a viſcous tranſparent liquor, ſerving to line and lubricate the part, that the ſeed and the urine may ſlip more freely, without either adhering to, or lacerating the part. The mucus of the noſtrils is a viſcid excrementitious humour, ſeparated by its proper glands, placed in the internal membrane of thoſe parts, ſerving to moiſten, lubricate, and defend the olfactory nerves which being extremely ſoft and naked, would, without ſuch proviſion, be ſoon ſpoiled.

MUER, a town of Germany, in the circle of Auſtria, and dutchy of Stiria, ſituated on the river Muer, twenty-five miles north-weſt of Gratz.

MUER is alſo a river of Germany, which riſes in Bavaria, and running eaſt thro' the dutchy of Stiria, by Muer and Gratz, unites with the river Drave, at Legard, near Kaniſha, in Hungary.

MUFFLE, in metallurgy, an arched cover, reſiſting the ſtrongeſt fire, and made to be placed over coppels and teſts in the operations of aſſaying, to preſerve them from the falling of coals and aſhes into them; though, at the ſame time, of ſuch a form, as is no hindrance to the action of the air and fire on the metal, nor to the inſpection of the aſſayer. The muffles may be made of any form, providing they have theſe conditions; but thoſe uſed with coppels are commonly made ſemicylindrical; or when greater veſſels are employed, in form of a hollow hemiſphere. The muffle muſt have holes, that the aſſayer may look in; and the fore part of it muſt be always quite open, that the air may act better in conjunction with the fire, and be inceſſantly renewed: the apertures in the muffle ſerve alſo for the regimen of the fire, for the cold air ruſhing into the large opening before, cools the bodies in the veſſel; but if ſome coals are put in it, and its aperture before be then ſhut, with a door fitted to it, the fire will be increaſed to the higheſt degree, much more quickly than it can be by the breathing holes of the furnace. Another uſe of theſe apertures is alſo, that the arſenical vapours of lead and antimony paſſing through the holes in the back part of the muffle, may not be offenſive to the aſſayer, who ſtands before it. As to the height, length, and depth of the muffles, theſe muſt be proportioned to the ſize and number of the veſſels they are intended to cover; and care muſt be taken in this, that all the parts of the inner ſurface of theſe veſſels be in the reach of the aſſayer's eye. The moſt frequent ſize of the muffle is, however, four inches high,

ſix or eight long, and four or ſix inches broad. The ſegments cut off at the baſes, for the leſſer holes, muſt be of ſuch a proportioned height that the leaſt veſſels put under, may not be in the way of coals or aſhes falling into them. Wooden moulds of a proper ſhape are moſt convenient for making theſe muffles in, and the matter for making them, is the ſame with that of the german clay-teſts; that is, either of a pure native clay, of a condition to bear the fire, which will be known upon the trial; or ſuch clay hardened by a mixture of the powder of ſtones: and, in order to the forming of theſe, the maſs muſt be made tolerably ſoft and pliant, by kneading it on a flat ſtone; then ſpread it out evenly into a thin cake, ſomewhat longer and broader than you intend the muffle to be made; and ſo thick, that two or more thin plates, of about two lines thick each, may be cut off from it. One of thoſe thin plates being cut off from the cake, is to be rubbed over with oil or fat, and then laid over the mould; then cut out a ſemicircular piece from the maſs, of the ſame thickneſs with the former, and lay this on the back plane of the mould, joining the edges of this plate to thoſe of the former, wetting them well with water: another thin plate muſt be cut off, for the bottom of the muffle. The muffle thus made, let it be wetted, and carefully rubbed over, and then expoſed to the air, and afterwards baked in a baker's kiln, or aſſayer's oven.

MUFTI, or MUPHTI, the chief of the eccleſiaſtical order, or primate, of the muſſulman religion. The authority of the mufti is very great in the ottoman empire; for even the ſultan himſelf, if he would preſerve any appearance of religion, cannot, without hearing his opinion, put any perſon to death, or ſo much as inflict any corporal puniſhment. In all actions, eſpecially criminal ones, his opinion is required, by giving him a writing, in which the caſe is ſtated, under feigned names; which he ſubſcribes with the words, *He ſhall*, or *ſhall not be puniſhed*. Such outward honour is paid to the mufti, that the grand ſeignior himſelf riſes up to him, and advances ſeven ſteps to meet him, when he comes into his preſence. He alone has the honour of kiſſing the ſultan's left ſhoulder, whilſt the prime vizier kiſſes only the hem of his garment; when the grand ſeignior addreſſes any writing to the mufti, he gives him the following titles: "To the eſad, the wiſeſt of the wiſe; inſtructed in all knowledge; the moſt excellent of excellents; abſtaining from things unlawful; the ſpring of virtue and true ſcience; heir of the prophetic doctrines; reſolver of the problems of faith; revealer of the orthodox articles; key of the treaſures of truth; the light to doubtful allegories; ſtrengthened with the grace of the ſupreme legiſlator of mankind; may the moſt high God perpetuate thy virtues." The election of the mufti is ſolely in the grand ſeignior, who preſents him with a veſt of rich ſables, *&c.* If he is convicted of treaſon, or any great crime, he is put into a mortar, kept for that purpoſe in the Seven Towers at Conſtantinople, and pounded to death.

MUGGLETONIANS, a religious ſect, which aroſe in England, about the year 1657; ſo denominated from their leader Lodowick Muggleton, a journeyman taylor, who, with his aſſociate Reeves, ſet up for great prophets, pretending, as it is ſaid, to have an abſolute power of ſaving and damning whom they pleaſed; and giving out, that they were the two laſt witneſſes of God, that ſhould appear before the end of the world.

MUGIL, in itchthyology. See MULLET.

MUG-WORT, in botany, the ſame with the artemiſia. See ARTEMISIA.

Mug-wort has long been famous as an uterine and antiſpaſmodic, and a medicine of great power in all diſeaſes of the nerves. It is evidently aperient and abſtergent: it promotes the menſes, and cleanſes the womb. It is given in decoction, or, much more agreeably, in a light infuſion, in the manner of tea. The midwives uſe it externally, by boiling it, and applying it to the belly, to promote the menſtrual diſcharge, or the expulſion of the ſecundines. It is by ſome much recommended as a cure for the ſciatica, and is to be taken for this purpoſe, either in powder, two drams for a doſe; or the expreſſed juice drank, an ounce or two, twice a day, for ſome months.

MUID, a large meaſure, in uſe among the french, for things dry. The muid is no real veſſel uſed as a meaſure, but an eſtimation of ſeveral other meaſures, as the ſeptier, mine, minot, buſhel, *&c.* See the article MEASURE.

MUID is alſo one of the nine caſks, or regular veſſels uſed in France, to put wine and

and other liquors in. The muid of wine is divided into two demi-muids, four quarter-muids, and eight half-quarter-muids, containing 36 leptiers.

MUL, or MULL, one of the weſtern iſlands of Scotland, being part of the ſhire of Argyle, and lying to the weſtward of it: this iſland is twenty-four miles long, and in ſome places as many broad.

MUL, or MULL *of Cantire*, the ſouth cape or promontory of the county of Cantire or Mul, in the firth of Clyde, on the weſt of Scotland.

MUL, or MULL *of Galloway*, the ſouth cape or promontory of all Scotland, in the county of Galloway, on the Iriſh ſea.

MULATTO, a name given in the Indies to thoſe who are begotten by a negro man on an indian woman, or an indian man on a negro woman.

MULBERRY, *morus*, in botany, a genus of the monoecia-tetrandria claſs of plants, having no corolla; the ſtamina are four ſubulated erect filaments, longer than the cup; there is no pericarpium; the cup is very large, carnoſe, ſucculent, and baccated, containing a ſingle ovato-acute ſeed.

The leaves of this tree are uſed for feeding ſilkworms, for which purpoſe it ſhould not be allowed to grow tall, but kept in a ſort of hedge; and inſtead of pulling off the leaves ſingly, they ſhould be cut off with ſheers, together with the young branches. See SILKWORM.

MULCT, a fine of money laid upon a man, who has committed ſome fault or miſdemeanor.

MULCH, a term uſed by gardeners for rotten dung, or the like, thrown upon beds of young plants, to preſerve them from the bad effects of cold or drought.

MULDAW, a river of Bohemia, that ariſes on the confines of Auſtria, and, running north, through Bohemia, unites with the Elbe at Melnick.

MULDORF, a town of Germany, in the circle of Bavaria, ſituated on the river Inn, forty miles eaſt of Munich.

MULE, in zoology, a mongrel kind of quadruped, uſually generated between an aſs and a mare, and ſometimes between a horſe and a ſhe-aſs. The mule is a ſort of a monſter, of a middle nature between its parents, and therefore incapable of propagating its ſpecies; ſo careful is nature to avoid filling the world with monſters. Mules are chiefly uſed in countries where there are rocky and ſtony roads, as about the Alps, Pyrenees, &c. Great numbers of them are kept in theſe places; they are uſually black, ſtrong, well limbed, and large, being moſtly bred out of the fine ſpaniſh mares: the mules are ſometimes fifteen or ſixteen hands high. No creatures are ſo proper for carrying large burdens, and none ſo ſure-footed. They are much ſtronger for draught than our horſes, and are often as thick-ſet as our dray-horſes; and they will travel ſeveral months together, with ſix or eight hundred weight upon their backs: they are much hardier and ſtronger than horſes, and will live and work twice the age of a horſe; and thoſe mules which are light are fitter for riding than horſes, as to the walk and trot; but they are apt to gallop rough.

MULHAUSEN, a town of Germany, in the landgravate of Alſace, ſituated on the river Ill, forty miles ſouth of Straſburg.

MULHAUSEN, is alſo a town of Germany, in the circle of upper Saxony, and territory of Thuringia, ſituated ſixteen miles north-weſt of Sax gotha.

MULIEBRIA, a term uſed to ſignify the privities of women.

MULIER, in law, ſignifies the lawful iſſue born in wedlock, though begotten before. The mulier is preferred to an elder brother born out of matrimony; as, for inſtance, if a man has a ſon by a woman before marriage, which iſſue is a baſtard, and afterwards marries the mother of the baſtard, and they have another ſon, this ſecond ſon is mulier and lawful, and ſhall be heir of the father, but the other can be heir to no perſon. See the article BASTARD.

By the civil law, where a man has iſſue by a woman, if after that he marries her, the iſſue is mulier.

MULIERTY, ſignifies the condition of a mulier, or lawful iſſue.

MULLER, or MULLAR, denotes a ſtone flat and even at the bottom, but round a-top, uſed for grinding of matters on a marble. The apothecaries uſe mullers to prepare ſome of their teſtaceous powders, and painters for their colours, either dry or in oil.

Muller is alſo an inſtrument uſed by the glaſs-grinders; being a piece of wood, to one end whereof is cemented the glaſs to be ground. It is ordinarily about ſix inches long, turned round. See the article GLASS-GRINDING.

MULLERAS, a town of Germany, in the circle of Upper Saxony, and marquiſate of Brandenburg, ſituated thirty-eight miles ſouth-eaſt of Berlin.

MULLET, *mugil*, in ichthyology, a genus of the acanthopterygeous fiſhes, the head of which is of a depreſſed form in the anterior part, and the body oblong and compreſſed. On each ſide of the head, below the noſtrils, there ſtands a little bone, which is ſerrated on its lower part; the eyes are not covered with a ſkin; and there are teeth on the tongue and palate, but none in the jaws or fauces; the branchioſtege membrane on each ſide contains ſix oſſicles; theſe are of a crooked figure, and the upper one, which is the broadeſt, is covered by the coverings of the gills in ſuch a manner, that only five appear.

MULLET is alſo a name for ſeveral ſpecies of the trigla. See TRIGLA.

MULLET, or MOLLET, in heraldry, a bearing in form of a flat, or rather of the rowel of a ſpur, which it originally repreſented,

The mullet has but five points; when there are ſix it is called a ſtar; tho' others make this difference, that the mullet is, or ought to be always pierced, which a ſtar is not. See plate CLXXXI. fig. 2.

The mullet is uſually the difference or diſtinguiſhing mark for the fourth ſon, or third brother, or houſe; though it is often borne alone, as coat-armour.

MULLUS, the ſame with mullet. See the article MULLET.

MULSUM, MULSE, a liquor made of wine and honey, or even of wine and water. See the article HYDROMEL.

MULTA, or MULTURA EPISCOPI, is ſaid to be a ſatisfaction antiently made to the king by the biſhops, in order that they might have power to make their laſt wills and teſtaments; and have the probate of the wills of other men, and alſo the granting of adminiſtrations.

MULTAN, or MOUTAN, a city of hither India in Aſia, capital of the province of Multan, ſituated on the river Indus, eaſt long. 72° 15′, north lat. 30°.

MULTANGULAR, a figure, or body, which has many angles.

MULTILATERAL, in geometry, is applied to thoſe figures which have more than four ſides or angles, more uſually called polygons. See the article POLYGON.

MULTINOMIAL, or MULTINOMIAL ROOTS, in mathematics, ſuch roots as are compoſed of many names, parts, or members; as $a+b+d+c$, &c. See the article ROOT.

MULTIPLE, *multiplex*, in arithmetic, a number which comprehends ſome other ſeveral times, thus 6 is a multiple of 2, and 12 is a multiple of 6, 4, and 3, comprehending the firſt twice, the ſecond thrice, &c.

MULTIPLE RATIO, or PROPORTION, is that which is between multiples. If the leſſer term of the ratio be an aliquot part of the greater, the ratio of the greater to the leſs is called multiple; and that of the leſs to the greater ſubmultiple. A ſubmultiple number is that contained in the multiple; thus, the numbers 1, 2, and 3, are ſubmultiples of 9. Duple, triple, &c. ratios, as alſo ſubduples, ſubtriples, &c. are ſo many ſpecies of multiple and ſubmultiple ratios. See the article RATIO.

MULTIPLICAND, in arithmetic, one of the factors in the rule of multiplication; being that number which is given to be multiplied by another, which is called the multiplicator, or multiplier.

MULTIPLICATION, in general, the act of increaſing the number of any thing.

Multiplication, in arithmetic, is a rule by which any given number may be ſpeedily increaſed, according to any propoſed number of times.

Multiplication, which is the fourth rule in arithmetic, ſerves inſtead of many additions; the product of a multiplication being only the repetition of the multiplicand ſo many times, as there are units in the multiplier.

Caſe I. To multiply ſingle numbers by one another.

All the variety that can happen in this caſe is expreſſed in the following table of multiplication, which muſt be perfectly got by heart, for the ready performance of any operation in multiplication: thus we learn, by the table, that 3 times 3 is 9; that 3 times 6 is 18, &c. We have in this table, omitted multiplying with 2, it being ſo very eaſy that any one may do it.

MULTIPLICATION TABLE.

3×3=9	4×4=16	5×5=25	6×6=36	7×7=49	8×8=64
3×4=12	4×5=20	5×6=30	6×7=42	7×8=56	8×9=72
3×5=15	4×6=24	5×7=35	6×8=48	7×9=63	9×9=81
3×6=18	4×7=28	5×8=40	6×9=54		
3×7=21	4×8=32	5×9=45			
3×8=24	4×9=36				
3×9=27					

Case II. To multiply a compound number by a single one,

Rule. Having placed the multiplier under the unit's place of the multiplicand; first, multiply the unit of the multiplicand by the multiplier; if their product be less than ten, set it down underneath its own place of units, and proceed to the next figure of the multiplicand: but if their product be above ten, or tens, then set down the overplus only, or odd figure, as in addition, and carry the said ten or tens in mind, till you have multiplied the next figure of the multiplicand with the multiplier: then, to their product add the ten or tens beared in mind, setting down the overplus of their sum above the tens, as before; and so proceed in that manner until all the figures of the multiplicand are multiplied with the multiplier.

Example. Suppose it were required to multiply 3213 by 3.

3213 Multiplicand.
3 Multiplier.

9639

For, beginning at the unit's place 3, say 3 times 3 is 9, which, because it is less than ten, set down underneath its own place, and proceed to the next place of tens, saying 3 times 1 is 3, which set down underneath its own place; then at the next place, *viz.* of hundreds, say 3 times 2 is 6, which set down as before; lastly, at the place of thousands, say 3 times 3 is 9, which being set down underneath its own place, the operation is finished, and the true product is 9639.

Case III. To multiply one compound number by another.

Rule. Place every number respectively under its own kind: multiply each figure of the multiplicand by each figure of the multiplier as before; and observe to set the first figure of each respective product under that figure of the multiplier, by which it was made; lastly, add the several products together for the whole product.

Example 1. Let it be required to multiply 78094 by 7563.

The operation. 78094	Multiplicand.
7563	Multiplier.
234282	The first particular product with 3.
468564	The second particular product with 60.
390470	The third particular product with 500.
546658	The fourth particular product with 7000.
590624922	The total, or true product required.

When there is a cypher or cyphers to the right hand, either of the multiplicand or multiplier, or to both, in that case, multiply the figures as before, neglecting the cyphers until the particular products are added together; then to their sum annex so many cyphers as there are in either or both the factors, as in the following examples.

Example 2.	Example 3.	Example 4.
9538	87600	785000
4600	79	56900
57228	7884	7065
38152	6132	4710
43874800	6920400	3925
		44666500000

If

If it be required to multiply any number by 10, 100, 1000, 10000, &c. it is only annexing the cyphers of the multiplier to the figures of the multiplicand, and the work is done: thus $578\times10=5780$, $578\times100=57800$, $578\times1000=578000$, $578\times10000=5780000$, &c. If a quantity be multiplied by the component part of the multiplier, the product will be the same as if it had been multiplied by the multiplier itself: thus, 245 by 7, and the product by 6 is the same as if 245 was multiplied by 7×6, that is by 42.

For the proof of multiplication, it is to be observed that the product is then right when being divided by the multiplier it quotes the multiplicand; or divided by the multiplicand it quotes the multiplier. See the article DIVISION.

Cross MULTIPLICATION, otherwise called duodecimal arithmetic, is an expeditious method of multiplying things of several species, or denominations, by others likewise of different species, &c. *e. g.* Shillings and pence, by shillings and pence; feet and inches, by feet and inches.

This is much used in measuring, &c. and the method is thus:

Suppose 5 feet 3 inches to be multiplied by 2 feet 4 inches; say 2 times 5 feet is 10 feet, and 2 times 3 is 6 inches; again, say 4 times 5 is 20 inches, or 1 foot 8 inches; and 4 times 3 is 12 parts, or 1 inch: the whole sum makes 12 feet 3 inches. In the same manner you may manage shillings and pence, &c.

	F.	I.
	5	3
	2	4
	10	6
	1	8
		1
	12	3

For the multiplication of vulgar and decimal fractions, see the articles FRACTION and DECIMAL.

MULTIPLICATION, in algebra. The general rule for the signs is, that when the signs of the factors are alike (*i. e.* both + or both −) the sign of the product is +; but when the signs of the factors are unlike, the sign of the product is −.

Case 1. When any positive quantity, $+a$, is multiplied by any positive number, $+n$, the meaning is, that $+a$ is to be taken as many times as there are units in n; and the product is evidently na.

Case 2. When $-a$ is multiplied by n, then $-a$ is to be taken as often as there are units in n; and the product must be $-na$.

Case 3. Multiplication by a positive number implies a repeated addition: but multiplication by a negative implies a repeated subtraction. And, when $+a$ is to be multiplied by $-n$, the meaning is that $+a$ is to be subtracted as often as there are units in n: therefore the product is negative, being $-na$.

Case 4. When $-a$ is to be multiplied by $-n$, then $-a$ is to be subtracted as often as there are units in n; but to subtract $-a$ is equivalent to adding $+a$, consequently the product is $+na$. The second and fourth cases may be illustrated in the following manner:

It is evident that $+a-a=0$; therefore if we multiply $+a-a$ by n, the product must vanish or be 0, because the factor $a-a$ is 0. The first term of the product is $+na$ (by case 1.) Therefore, the second term of the product must be $-na$, which destroys $+na$; so that the whole product must be $+na-na=0$. Therefore, $-a$ multiplied by $+n$ gives $-na$.

In the like manner, if we multiply $+a-a$ by $-n$, the first term of the product being $-na$, the latter term of the product must be $+na$, because the two together must destroy each other, or their amount 0, since one of the factors (viz. $a-a$) is 0. Therefore, $-a$ multiplied by $-n$ must give $+na$.

If the quantities to be multiplied are simple, find the sign of the product by the last rule; after it place the product of the co-efficients, and set down all the letters after one another as before.

EXAMPLES.

Mult.	$+a$	$-2a$	$+6x$
By	$+b$	$+4b$	$-5a$
Product	$+ab$	$-8ab$	$-30ax$.

Mult.	$-8x$	$+3ab$
By	$-4a$	$-5ac$
Product	$+32ax$	$-15aabc$.

To multiply compound quantities, you must multiply every part of the multiplicand by all the parts of the multiplier taken one after another, and then collect all the products into one sum; the sum shall be the product required.

Mult.	$a+b$	$2a-3b$
By	$a+b$	$4a+5b$
Prod.	$aa+ab$	$8aa-12ab$
	$+ab+bb$	$+10ab-15bb$
Sum	$aa+2ab+bb$	$8aa-2ab-15bb$ Mult.

Mult.	$2a-4b$	$xx-ax$
By	$2a+4b$	$x+a$
Prod.	$4aa-8ab$	$xxx-axx$
	$+8ab-16bb$	$+axx-aax$
Sum	$4aa..0.-16bb$	$xxx..0..-aax$

Mult. $aa+ab+bb$
By $a-b$

Prod. $aaa+aab+abb$
$-aab-abb-bbb$

Sum $aaa..0...0..0..-bbb$

Products that ariſe from the multiplication of 2, 3, or more quantities as $a\,b\,c$, are ſaid to be of 2, 3, or more dimenſions; and thoſe quantities are called factors or roots.

If all the factors are equal, then theſe products are called powers; as $a\,a$ or aaa are powers of a. Powers are expreſſed ſometimes by placing, above the root to the right hand, a figure expreſſing the number of factors that produce them, thus:

a	1ſt	power of the	a
aa	2d	root a, and	a^2
aaa	3d	is generally	a^3
$aaaa$	4th	expreſſed	a^4
$aaaaa$	5th	thus:	a^5

Theſe figures which expreſs the number of factors that produce powers are called their indices or exponents; thus 2 is the index of a^2. And powers of the ſame root are multiplied by adding their exponents thus: $a^2\times a^3=a^5$. $a^4\times a^3=a^7$. $a^3\times a=a^4$.

Sometimes it is uſeful not actually to multiply compound quantities, but to ſet them down upon the ſign of Multiplication ($\times$) between them, drawing a line over each of the compound factors. Thus $\overline{a+b}\times\overline{a-b}$ expreſſes the product of $a+b$ multiplied by $a-b$.

MULTIPLICATION of ſurds. See SURDS.

MULTIPLICATOR, or MULTIPLIER, in arithmetic, a number multiplying another called the multiplicand. See MULTIPLICAND and MULTIPLICATION.

The larger number is generally made the multiplicand, and is placed above the ſmaller, or multiplicator: but the reſult is the ſame, which ſoever of the numbers be made multiplicand, or multiplier.

MULTIPLYING GLASS, in optics, one wherein objects appear increaſed in number.

It is otherwiſe called a polyhedron, being ground into ſeveral planes, that make angles with each other; through which the rays of light iſſuing from the ſame point undergo different refractions, ſo as to enter the eye from every ſurface in a different direction.

MULTISILIQUOUS PLANTS, thoſe which have after each flower many diſtinct, long, ſlender, ſiliquæ or pods, in which their ſeed is contained: ſuch are bear's foot, columbine, houſe-leek, navel-wort, orpine, &c.

MULTITUDE, an aſſemblage, or collection of a great number of diſtinct perſons or things: thus we ſay, a multitude of men, of horſes, of trees, &c. The units, or individuals, that make a multitude, may be of the ſame or different kinds, and natures of things; and that whether they are really ſeparated from one another, or only diſtinguiſhed by the imagination.

MULTIVALVES, in natural hiſtory, the name of a general claſs of ſhell-fiſh diſtinguiſhed from the univalves, which conſiſt of only one ſhell, and the bivalves, which conſiſt of two, by their conſiſting of three or more ſhells. See SHELL, UNIVALVES, and BIVALVES.

Of theſe there are much fewer ſpecies, than either of the univalve or bivalve claſs. A late accurate French author has ranked all the ſpecies under ſix genera, which are theſe: 1. The *echini* or ſea-eggs. 2. The *vermiculi* or ſea-worms. 3. *Balani* or center-ſhells. 4. The *pollipicides* or thumb-ſhells. 5. The *conchæ anatiferæ* or gooſe-ſhells. And 6. The *pholades*.

MULVIA, a river of Barbary, in Africa, which riſes in the mountains of Atlas, and divides the empire of Morocco from the kingdom of Algiers, and then falls into the Mediterranean, weſt of Marſalquiver.

MUM, a kind of malt-liquor, much drank in Germany; and chiefly brought from Brunſwick, which is the place of moſt note for making it. The proceſs of brew-

ing

ing mum, as recorded in the town-houſe of that city, is as follows: Take ſixty-three gallons of water that has been boiled till one-third part is conſumed, and brew it with ſeven buſhels of wheaten-malt, one buſhel of oat-meal, and one buſhel of ground beans; when it is tunned, the hogſhead muſt not be filled too full at firſt; as ſoon as it begins to work, put into it three pounds of the inner rind of fir; one pound of the tops of fir and beach; three handfuls of carduus benedictus; a handful or two of the flowers of roſa ſolis; add burnet, betony, marjoram, avens, penny-royal, and wild thyme, of each a handful and a half; of elder-flowers, two handfuls or more; ſeeds of cardamum bruiſed, thirty ounces; barberries bruiſed, one ounce; when the liquor has worked a while, put the herbs and ſeeds into the veſſel; and, after they are added, let it work over as little as poſſible; then fill it up: laſtly, when it is ſtopped, put into the hogſhead ten new-laid eggs unbroken; ſtop it up cloſe, and drink it at two years end. Our engliſh brewers, inſtead of the inner rind of fir, uſe cardamum, ginger, and ſaſſafras; and alſo add elecampane, madder, and red-ſanders. Mum, on being imported, pays for every barrel 1 l. 5 s.

MUMMY, a body embalmed or dried, in the manner uſed by the antient Egyptians: or the compoſition with which it is embalmed. There are two kinds of bodies denominated mummies: the firſt are only carcaſes dried by the heat of the ſun, and by that means kept from putrefaction: Theſe are frequently found in the ſands of Lybia. Some imagine, that theſe are the bodies of deceaſed people buried there on purpoſe to keep them intire without embalming; others think they are the carcaſſes of travellers, who have been overwhelmed by the clouds of ſand raiſed by the hurricanes frequent in thoſe deſarts. The ſecond kind of mummies are bodies taken out of the catacombs, near Cairo, in which the Egyptians depoſited their dead after embalming. For a further account of mummies, and the manner of embalming dead bodies, ſee EMBALMING.

We have two different ſubſtances preſerved for medicinal uſe under the name of mummy, though both in ſome degree of the ſame origin: the one is the dryed and preſerved fleſh of human bodies, embalmed with myrrh and ſpices; the other is the liquor running from ſuch mummies, when newly prepared, or when affected by great heat or damps. This latter is ſometimes in a liquid, ſometimes of a ſolid form, as it is preſerved in vials well ſtopped, or ſuffered to dry and harden in the air. The firſt kind of mummy is brought to us in large pieces, of a lax and friable texture, light and ſpungy, of a blackiſh brown colour, and often damp and clammy on the ſurface: it is of a ſtrong but diſagreeable ſmell. The ſecond kind of mummy in its liquid ſtate, is a thick opake and viſcous fluid, of a blackiſh colour, but not diſagreeable ſmell. In its indurated ſtate, it is a dry ſolid ſubſtance, of a fine ſhining black colour, and cloſe texture, eaſily broken, and of a good ſmell; very inflammable, and yielding a ſcent of myrrh, and aromatic ingredients while burning. This, if we cannot be content without medicines from our own bodies, ought to be the mummy uſed in the ſhops; but it is very ſcarce and dear, while the other is ſo cheap, that it will always be moſt in uſe.

All theſe kinds of mummy are brought from Egypt, but we are not to imagine, that any body breaks up the real egyptian mummies, to ſell them in pieces to the druggiſts, as they may make a much better market of them in Europe whole, when they can contrive to get them. What our druggiſts are ſupplied with, is the fleſh of executed criminals, or of any other bodies the Jews can get, who fill them with the common bitumen, ſo plentiful in that part of the world; and adding a little aloes, and two or three other cheap ingredients, ſend them to be baked in an oven, till the juices are exhaled, and the embalming matter has penetrated ſo thoroughly that the fleſh will keep, and bear tranſporting into Europe. Mummy has been eſteemed reſolvent and balſamic; but whatever virtues have been attributed to it, ſeem to be ſuch as depend more upon the ingredients uſed in preparing the fleſh, than in the fleſh itſelf; and it would ſurely be better to give thoſe ingredients without ſo ſhocking an addition.

Beſides the mummy, the human body has been made to furniſh many other ſubſtances for medicinal purpoſes: Thus the ſkull has been celebrated for its imaginary virtues againſt the diſeaſes of the head: the very moſs growing on the ſkulls of human ſkeletons, has been ſuppoſed

posed to possess anti-epileptic virtues: the fat of the human body has been recommended as good in rheumatisms; and the blood, and in short, every other part or humour of the body, have, at one time or other, been in repute for the cure of some disease: but at present we are grown wise enough to know, that the virtues ascribed to the parts of the human body are either imaginary, or such as may be found in other animal substances. The mummy, and skull alone, of all these horrid medicines, retain their places in the shops; and it were to be wished that they too were rejected.

MUMMY, among gardeners, a kind of wax used in grafting and planting the roots of trees, made in the following manner: Take one pound of black pitch, and a quarter of a pound of turpentine; put them together into an earthen pot, and set them on fire in the open air, holding something in your hand to cover and quench the mixture in time, which is to be alternately lighted and quenched till all the nitrous and volatile parts be evaporated. To this a little common wax is to be added; and the composition is then to be set by for use.

Dr. Agricola directs its being used in planting pieces of the roots of trees, in the following manner: melt it, and having let it cool a little, dip in the two ends of the pieces of root, one after another; then put them in water, and plant them in the earth, the small end downward, so that the larger may appear a little way out of the earth, in order to have the benefit of the air; then press the earth hard down about them, that they may not receive too much wet. This work he recommends to be performed in the months of September, October, and November.

This author recommends several other kinds of mummies, but as the ingredients are much the same, it would be to little purpose to insert them.

MUNDIC, in natural history, a metallic mineral, more commonly called marcasite. See the article MARCASITE.

MUNDIFICATIVES, in pharmacy, the same with cleansers or detergents. See DETERGENTS and VULNERARY.

MUNGATS, or MUNKATS, a town of upper Hungary: east long. 22°, north lat. 48° 30′.

MUNGO, or MUNGATHIA, an animal of the ferret-kind, of a reddish grey colour.

MUNICH, or MUNCHEN, a large and elegant city, the capital of the electorate and dutchy of Bavaria, situated on the river Iser: east long. 11° 32′, north lat. 48° 5′.

MUNICIPAL, in the roman civil law, an epithet which signifies invested with the rights and privileges of roman citizens. Thus the municipal cities were those whose inhabitants were capable of enjoying civil offices in the city of Rome: these cities, however, according to Mariana, had fewer privileges than the colonies: they had no suffrages or votes at Rome: but were left to be governed by their own laws and magistrates. Some few municipal cities, however, obtained the liberty of votes.

Municipal, among us, is applied to the laws that obtain in any particular city or province. And those are called municipal officers who are elected to defend the interest of cities, to maintain their rights and privileges, and to preserve order and harmony among the citizens. Such as mayors, sheriffs, consuls, &c.

MUNIMENTS, or MINIMENTS, the writings relating to a person's inheritance, by which he is enabled to defend his title to his estate: or, in a more general sense, all manner of evidences, such as charters, feofments, releases, &c.

MUNIMENT HOUSE, a little strong room in a cathedral, college, or university, destined for keeping the seal, charters, &c. of such cathedral, college, &c.

MUNIONS, in architecture, are the short, upright posts or bars which divide the several lights in a window frame.

MUNITION, the provisions with which a place is furnished in order for defence; or that which follows a camp for its subsistance. See AMMUNITION.

MUNITION SHIPS, are those that have stores on board in order to supply a fleet of men of war at sea. In an engagement, all the munition ships, and victuallers attending the fleet, take their stations in the rear of all the rest; they are not to engage in the fight, but to attend such directions as are sent them by the admiral.

MUNSTER, the capital of the bishopric of the same name, and of the circle of Westphalia, situated on the river Aa: east long. 7° 10′, north lat. 52°.

MUNSTER, is also a town of Germany, in the Landgraviate of Alsatia, subject to France: east long. 7° 5′, north lat. 48° 8′.

MUNSTER MEINFELT, a town of Germany,

many, in the circle of the lower Rhine, and electorate of Triers: east long. 7°, north lat. 50° 15′.

MUNSTERBERG, the capital of the dutchy of the ſame name in Sileſia: east long. 16° 40′, north lat. 50° 35′.

MUNTINGIA, in botany, a genus of the polyandria-monogynia claſs of plants, the corolla whereof conſiſts of five roundiſh petals, of the length of the cup; they are patent, and are inſerted in the cup; the fruit is a round unilocular berry, umbilicated with the ſtigma; the ſeeds are numerous, roundiſh, and ſmall.

MUPHTI. See the article MUFTI.

MURÆNA, in ichthyology, a genus of the malcopterigious claſs of fiſhes, the body of which is long, ſlender, and rounded; or ſubcylindric in ſome ſpecies: the fins are three, in others they are four, and in ſome again there is only one; at the very extremity of the roſtrum there are two ſhort tubes or foramina, one on each ſide, and theſe are the anterior apertures of the noſtrils; the branchioſtege membrane on each ſide contains ten ſlender and crooked bones, but the ſkin of the fleſh is thick and firm; ſo that till it is taken off, they are not eaſily diſcovered. This genus contains the common eel, and the conger or ſea-eel. See EEL.

The other ſpecies of this genus are the ſea ſerpent, the flat-tailed ſea-ſerpent, the ſpotted ſea-ſerpent, and the muræna ſimply ſo called. The ſea ſerpent is the cylindric muræna, with the tail naked and acute, and has vaſtly the appearance of the ſerpent kind; it grows to five feet in length, and to the thickneſs of a man's wriſt; the head is ſmall and the roſtrum acute, but the opening of the mouth is very large, and furniſhed with a vaſt number of very ſharp and ſtrong teeth, of unequal ſizes; the eyes are ſmall, their iris of a gold-yellow, and the pupil round and black; the pectoral fins ſtand juſt at the opening of the gills, are very ſmall, and have each ſixteen rays. The flat-headed ſea-ſerpent is the muræna, with the ſnout ſharp and ſpotted with white, and with the edge of the back-fin black; this has much the general reſemblance of the common eel, it grows to between three and four feet in length, and as thick as a man's wriſt. The ſpotted ſea-ſerpent is the ſlender ſpotted muræna, with a pointed naked tail, growing to four feet in length, and not thicker than an eel of but two and a half. The muræna ſimply ſo called, is that with no pectoral fins, being a ſingular ſpecies, having only one fin, which is the pinna dorſi, ſurrounding the tail and running up to the anus; it grows to two feet in length, and to the thickneſs of an eel of the ſame length.

MURAGE, a toll taken of every cart or horſe coming laden into a city, for repairing the walls.

MURAL, in general, any thing belonging to a wall, which the latins call murus.

MURAL ARCH, is a wall, or walled arch, placed exactly in the plane of the meridian, for fixing a large quadrant, ſextant, or other inſtrument, in order to obſerve the meridian altitudes of the heavenly bodies.

MURAL CROWN. See the article CROWN.

MURCIA, the capital of the province of the ſame name in Spain: weſt long. 1° 12′, north lat. 38° 6′.

MURDER, or MURTHER, in law, is the wilful and felonious killing a perſon from premeditated malice; provided the party wounded or otherwiſe hurt, die within a year and a day after the fact was committed.

It is malice, and not the bare killing that conſtitutes the crime of murder, which is either expreſſed or implied; expreſſed, when it is proved that there was ſome ill will, or grudge, before the killing, and that the fact was done with a ſedate mind, and a formed deſign of doing it: and implied, where a perſon kills another ſuddenly, having nothing to defend himſelf, as in going along a ſtreet, over a field, or the like. That murder which is perpetrated through a direct purpoſe to do ſome perſonal injury to the perſon ſlain, is ſaid to be of expreſs malice; and ſuch as happens in the execution of an illegal action, that was principally deſigned for ſome other purpoſe, and not manifeſted in its nature to do a perſonal injury to him who is killed, is moſt properly malice implied. Where a perſon voluntarily commits any violent or cruel act, which is attended with death, in the eye of the law he is looked upon as doing it out of malice aforethought; as where a man in cool blood maliciouſly beats another, in ſuch a manner, beyond any apparent deſign of chaſtiſement, that he dies: this is murder by expreſs malice, though there is no other proof that he intended to kill him. Where a perſon declares a reſolution to kill the firſt man he meets, and does kill him, it is murder; becauſe in this caſe malice is implied

implied againſt all mankind. Where two or more perſons aſſemble together, in order to commit ſome unlawful act, and one of them, by chance, kills another; this is murder in all that are preſent; and ſuch perſons are conſtrued to be preſent, if they are in the ſame houſe, though in another room; or if in the ſame park, tho' they are half a mile off. Where poiſon is laid, in order to kill a particular perſon, and another accidentally takes it, and dies, it is murder in the perſon who laid the poiſon. See the article MANSLAUGHTER.

By a late act, all perſons found guilty of wilful murder, are to be executed on the day next but one after ſentence paſſed, unleſs that day happens to be a Sunday; and in that caſe, they are to be executed on the Monday following. The judge may direct the body to be hung in chains, or to be delivered to the ſurgeons, in order to its being diſſected and anatomized; but in no caſe whatſoever is it to be buried, till after it is diſſected.

MURDERERS, or MURDERING PIECES, in a ſhip, are ſmall pieces of ordnance, either of braſs or iron, which have chambers put in at their breeches. They are uſed at the bulk-heads of the forecaſtle, half-deck, or ſteerage, in order to clear the deck, on the ſhip's being boarded by an enemy.

MURENGERS, two officers of great antiquity in the city of Cheſter, annually choſen out of the aldermen, to ſee that the walls are kept in repair, and to receive a certain toll and cuſtom, for the maintenance thereof.

MURET, a town of France, in the province of Gaſcony, twelve miles ſouth of Toulouſe.

MUREX, in natural hiſtory, a genus of univalve or ſimple ſhells, without any hinge, formed of a ſingle piece, and beſet with tubercles or ſpines: the mouth is large and oblong, and has an expanded lip, and the clavicle is rough.

The animal, which inhabits this ſhell, is called limax, or ſnail. See SNAIL.

The clavicle of the murex is in ſome ſpecies elevated, in others depreſſed; and the mouth is ſometimes dentated, and at others ſmooth: the lip alſo in ſome is digitated, in others elated, and in ſome laciniated; and the columella is in ſome ſmooth, in others rugoſe.

Of this genus there are a great many very elegant ſpecies, among which is, the ſpider-ſhell, or rugoſe murex, with a protended lip, and ſix long cornicles, or legs; which grows to three inches in length, and two and a half in diameter; its general colour being a tawny brown, variegated with darker clouds: and the ribbed muſic-ſhell, or obſcurely coſtated murex, with ſtriated zones: it is about two inches long, and near an inch and half in diameter; its ground-colour is a whitiſh brown, and it is ſurrounded with three or four elegant zones, formed of four or five parallel black lines, with ſpots of a blackiſh or rediſh colour between them; reſembling very much the lines in which muſic is written, with the marks of crotchets, &c. whence the name. There is alſo a leſſer muſic-ſhell, rather more elegant than the former.

MURING, among builders, the raiſing of walls. See the article WALL.

MURIA, ALIMENTARY SALT, in natural hiſtory. See the article SALT.

MURO, a town of Italy, in the kingdom of Naples, ſixty miles ſouth-eaſt of the city of Naples.

MURRAIN, or GARGLE, a contagious diſeaſe among cattle, principally cauſed by a hot dry ſeaſon, or rather by a general putrefaction of the air, which begets an inflammation of the blood, and a ſwelling in the throat, that ſoon prove mortal, and is communicated from one to another, though it generally goes no farther than to thoſe of the ſame kind.

The ſymptoms of this diſeaſe are a hanging down and ſwelling of the head, abundance of gum in the eyes, rattling in the throat, a ſhort breath, palpitation at the heart, ſtaggering, a hot breath, and a ſhining tongue.

In order to prevent this diſeaſe, the cattle ſhould ſtand cool in ſummer, have plenty of good water; all carrion ſhould be ſpeedily buried, and as the ſeeding of cattle in wet places, on rotten graſs and hay, often occaſions this diſeaſe, dry and ſweet fodder ſhould be given them. The following receipt is much recommended for the cure of this diſeaſe in black cattle: Take diapente, a quarter of an ounce; dialthæa or marſhmallows, london treacle, mithridate and rhubarb, of each the quantity of a nut; of ſaffron, a ſmall quantity; wormwood, and red ſage, of each an handful; and two cloves of garlick: boil all together in two pints of beer, till it be reduced to a pint and a half, and give it the beaſt luke-warm, while faſting: half the proportion will ſerve for a cow; they muſt be kept warm,

and take a mash of ground malt, drinking warm water for a week, and sometimes have boiled oats. If sheep are troubled with this distemper, give them a few spoonfuls of brine, and then a little tar.

MURRAY, a county of Scotland, bounded by the German Sea, on the north; by Bamf, on the east; by Mar and Badenoch, on the south; and by Inverness, on the west.

MURREY, in heraldry, a kind of purple colour. See the article SANGUINE.

MURRHINE, or MORRHINE VESSELS, in antiquity, a kind of porcellain-ware, used in cups and vases; though some will have them to have been made of a precious stone, of the agate-kind.

There were also murrhine vessels, made at Diospolis, in Egypt; which was a kind of glass-ware, made in imitation of the true sort, brought from India.

MURTHER, or MURDER. See MURDER.

MURTHERING PIECES, or MURDERERS. See the article MURDERERS.

MUS, in zoology, a genus of quadrupeds, of the order of the agriæ, the characters of which are these: the fore-teeth are acute, and there are no canine teeth at all; the feet are divided, and the ears naked.

Of this genus there are a great many species, known by distinct english names; as the rat, mouse, dor-mouse, or sorex, citille, agutis, guinea-pig, &c. See the article RAT, MOUSE, &c.

MUSA, the PLANTAIN-TREE, in botany, a genus of the polygamia class of plants, the flower of which consists of two petals; one of which is erect, and divided by five indentings at the edge; and the other is hollow, shorter, and nectariferous: the stamina are six; and the fruit is an oblong, triquetrous berry.

MUSCA, the FLY, in zoology. See FLY.

MUSCÆ VOLITANTES, certain dark spots, seen by many people on looking at the sky, a candle, or other bright object; so called from their resembling flies. See the article EYE.

MUSCADINE, a rich kind of wine, of the growth of Provence and Languedoc, in France. See the article WINE.

MUSCLE, *musculus*, in anatomy, a part of the human body, destined to move some other part, and that in general by a voluntary motion, or such as is dictated by the will; being composed principally of flesh and tendinous fibres, which have also vessels of all kinds, as arteries, veins, nerves, and lymphatics; all which are surrounded by, or enclosed in, one common membrane.

The muscular fibres are, according to the action they are intended for, of various directions; some streight, others oblique, transverse, annular, and spiral. Some consist of one uniform series of fibres, and on that account are called simple; others are composed of various, and often contrary courses of fibres, and these being closely arranged together, the large one seems to be made up of a number of lesser muscles, and is therefore called compound; and the more of these clusters of fibres, or smaller vessels, enter into the composition of a larger one, the thicker and stronger it is.

A muscle is divided, by anatomists, into the body, and the two extremities: the body *c* (plate CLXXXIV. fig. 2.) is also called the venter or belly of the muscle; and the two extremities, if white, are called tendons; whereof that marked *a* is the right, and *b* the left. Fig. 3. *ibid.* represents a simple muscle opened, to shew the internal series of fleshy fibres: and fig. 4. exhibits a section of a regular compound muscle, shewing the arrangement of fibres in each belly.

That extremity where the muscle arises, is called its head, caput; or its beginning, origin, or fixed point: and its other extremity, or end, is called its tail, moveable point, and often its tendon; and, finally, if this be broad and membranous, it is called an aponeurosis.

In many of the muscles, both the extremities are moveable: in these, that part which of the two is least moveable, is always called the head, and the more moveable part the tail. This, however, cannot be done universally; since there are cases in which that extremity of a muscle, which was before the moveable point, becomes the fixed point; and *vice versa*, as in the serrati antici, and some of the muscles of the abdomen, not to mention any others.

Action of the MUSCLES. This consists in the contraction of its belly, after whatever manner that is done: by this means its extremities approach toward each other; and, by this means also, the part in which the end of the muscle is inserted, moves as if it were drawn by a cord. Schelhammer is of opinion, that this contraction of the belly of the muscle is effected by a corrugation of the fibres, in the same manner as we see an earth-worm shorten and contract itself by corrugating

BRITISH MUSEUM

Fig. 1. MUSCLES of the fore part of the Human Body.

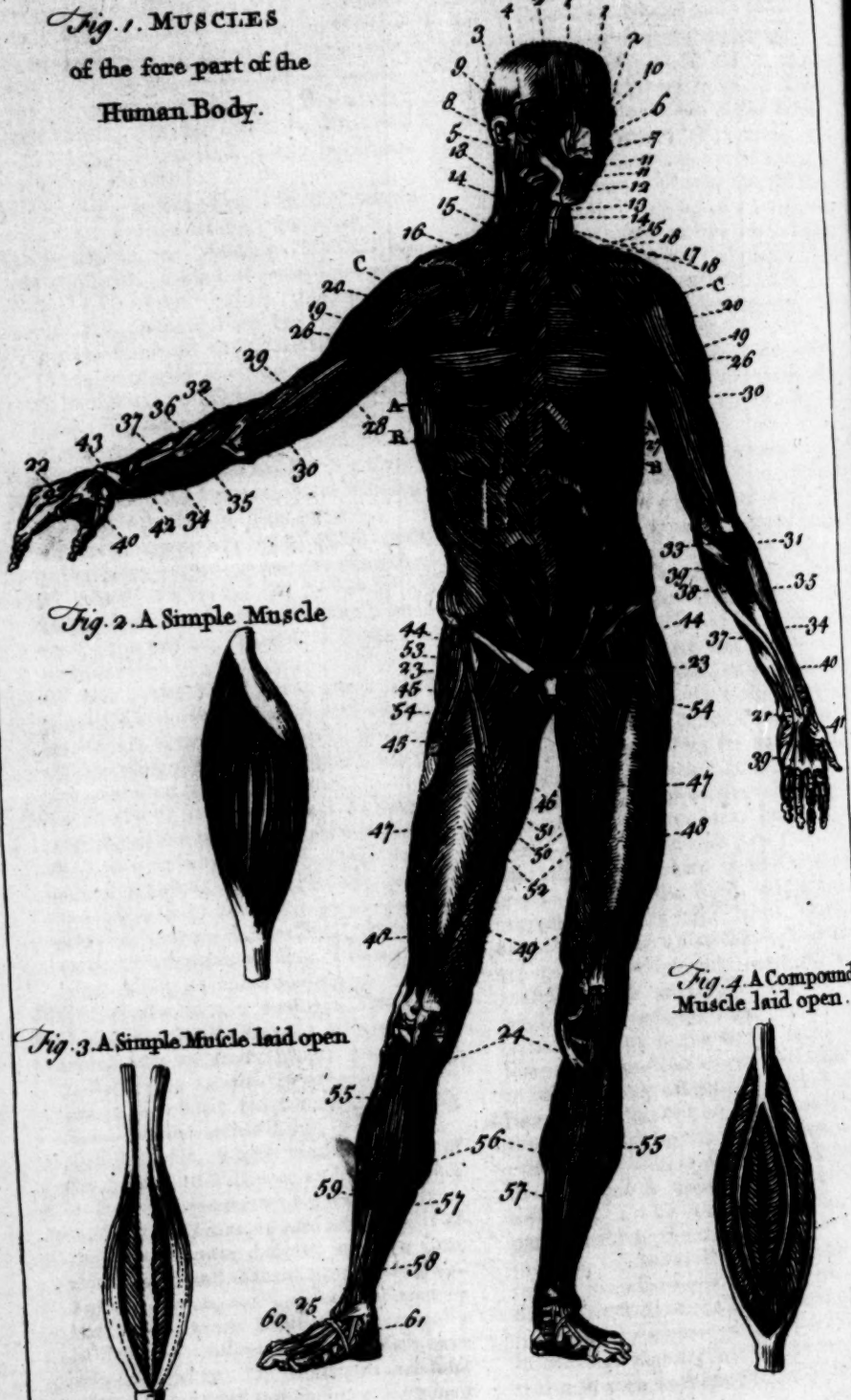


Fig. 2. A Simple Muscle

Fig. 3. A Simple Muscle laid open

Fig. 4. A Compound Muscle laid open.

J. Sheppard sculp

rugating its ſkin, &c. Morgagni, on the other hand, alledges, that in order to underſtand the power of motion in a muſcle, we ought to attend to Wallis's experiment; by which it is evidently proved, that the ſmalleſt force imaginable of the air, driven through a cylindric tube into a bladder, will, by diſtending its width, and ſhortening its length, cauſe it to riſe up, and ſuſtain a weight of ſixty or ſeventy pounds.

Others have demonſtrated, from hydroſtatical principles, that a very ſmall quantity of a fluid, directed through a ſmall cylindric tube, placed in a veſſel of a larger baſe, and already filled, will be able, in the ſame manner, to move and raiſe up a large weight; from whence they conclude, that the belly of a muſcle ſwells in the time of its contraction or action; and that this intumeſcence may, nay and muſt, have very great effects.

On the other hand, there are, among the lateſt and moſt celebrated writers, ſome who affirm that the belly of a muſcle does not ſwell or become diſtended at all in the time of its contraction. But it would be well, ſays Heiſter, if the aſſerters of this opinion would, while they forcibly draw up the under jaw to the upper, lay two or three of their fingers upon either the temporal or maſſeter muſcle; for, in this caſe, they would ſee the moſt evident of all conviction, that, while theſe muſcles act, their bellies are in reality diſtended, and rendered firmer. Or let them only, when the hand is placed in a proper ſituation, forcibly draw the thumb towards the firſt finger, and then they may both ſee and feel, that the muſcle between the thumb and the index ſwells, or is diſtended in its middle, as the action of drawing the thumb is performed. The reader who would enter more deeply into this diſquiſition, may conſult Borelli de Motu animalium; Bernouilli de Motu muſcul. Berger's Phyſiolog. c. 22. Boerhaave's Inſtitutes, chap. of muſcular motion; and Mead's Introduction to Cowper's Myographia.

Among the muſcles, there are different ones that conſpire in the ſame action, and ſo perform the ſame motion as aſſociates; ſuch are the flexors or extenſors of the arm, and the like: hence theſe, and ſuch others as conſpire in the ſame manner to the ſame action, are called by authors ſocii and congeneres.

When, on the other hand, we regard the contrary actions of certain muſcles, as the extenſors of any part which act quite contrary to the flexors, theſe are called antagoniſt muſcles; in this caſe both the kinds acting together, render the limbs rigid or immoveable: this action of the muſcles is called motus tonicus. It is alſo obſervable, that ſeveral of the muſcles, conſidered ſingly and ſeparately, perform other kinds of motions beſides thoſe aſcribed to them in regard to the whole part: thus the maſtoide muſcle, the rectus major capitis, &c. when they act on both ſides, bend the head forwards; but when only on one ſide, they draw the head obliquely downwards, and to one ſide. Hence, from the diverſity of the muſcles, which act either alone or conjunctly with their aſſociates, or with others, there ariſe ſeveral intermediate motions, quite different from the primary ones, and ſuch as have not hitherto been ſufficiently obſerved. This does not only happen in regard to the muſcles of the head, the flexors and extenſors, and the like, but to ſeveral others; and particularly to thoſe of the eyes, the lips, the jaws, the tongue, the neck, the abdomen, the arm, the carpus, &c. Theſe we are carefully to attend to, and explain to ourſelves, by what particular muſcles, acting diſtinctly, they are performed; otherwiſe we ſhall never be able to underſtand the various and wonderful motions of the parts. Winſlow, in his excellent obſervations on the actions of the muſcles, publiſhed in the Memoirs of the Paris-Academy, obſerves, among other curious things, that a great many of the motions of the muſcular parts are not owing to the ſuppoſed contraction, but to the relaxation of the muſcles on the oppoſite ſide.

Inſertion and force of the MUSCLES. The all-wiſe author of nature has furniſhed animals with limbs, moveable about the joints by means of muſcular cords, inſerted near the joints or center of motion; the great wiſdom of which contrivance will appear, from ſuppoſing the inſertion to be at E (plate CLXXXV. fig. 2.) near the wriſt B, the muſcle D E being either looſe and ſeparate from the bones D A B, or bound down to it by ſome ligament or faſcia R; in either of which caſes the bone A B cannot be turned up quite to the ſituation A H, unleſs the muſcle D E be contracted or ſhortened to D M, which would not only be troubleſome but even impoſſible. It would be

trouble-

troubleſome becauſe the breadth and thickneſs of the arm would be vaſtly increaſed, ſo as to become as big as the belly of an animal. On the other hand, the ſtructure of a muſcle being ſuch that it cannot be contracted but a little, ſeldom above two or there fingers breadth; ſuch an inſertion as that at E, which requires a contraction of above a foot and a half, would be altogether impoſſible. Therefore, in fact, we find the muſcles inſerted near the center of motion, as at I, *ibid.* fig. 3.

In order to calculate the force of any muſcle, we are to conſider the bones as levers; and then the power or force of the muſcle will be always to the reſiſtance or weight it is capable of raiſing, as the greater diſtance of the weight from the center of motion is to the leſſer diſtance of the power. Hence, it being found by experiments, that a robuſt young man is able to ſuſpend a weight R *(ibid.* fig. 3.) equal to twenty-eight pounds, when the arm is extended in a ſupine and horizontal ſituation, we have this proportion, *viz.* the force of the muſcle I D is to the weight R, = 28 lb. as the diſtance B C is to the diſtance I C. But it is found, that B C, the length of the cubit and hand, is more than twenty times greater than I C, the diſtance of the muſcle from the center of motion. Therefore the force of the muſcle I D, muſt be more than twenty times greater than the weight R, or more than 28 × 20 = 560 lb.

Again, to find the force which the biceps and brachiæus muſcles exert, when the humerus E A *(ibid.* fig. 4) is perpendicular to the horizon, we are firſt to conſider what weight a man is capable of ſuſtaining in this poſture, *viz.* R = 35 lb. and next the quantity of the diſtances C B, C I. which in this caſe are as 16 to 1. Therefore the force of theſe muſcles is to the weight R = 35 lb. as the diſtance C = 16 is to the diſtance of I C = 1; or the force is equal to 560, as before.

But what appears moſt wonderful, is the force of the muſcles that move the lower jaw; which, when taken altogether, do not in a man exceed the weight of 1 lb. and yet exert a force equal to 534 lb. and in maſtive dogs, wolves, bears, lions, *&c.* their force is vaſtly ſuperior, ſo as to break large bones, as they practiſe daily in their feeding.

The motions of the far greater part of the muſcles are voluntary, or dependent on our will; thoſe of a few others, involuntary. The former are called animal, the other natural motions. Finally, the motions of ſome of the muſcles are of a mixed kind, partly animal and partly natural. Thoſe muſcles which perform the voluntary motions receive nerves from the brain or ſpinal marrow: thoſe which perform their motions involuntarily, have their nerves from the cerebellum; and thoſe whoſe motion is partly voluntary and partly involuntary, have theirs in part from the brain, and in part from the cerebellum. And as a muſcle can no longer act when its nerve is either cut aſunder or tied up, ſo the ſame abſolute dependence it has on its artery: for from the experiments of Steno and others on living animals, it appears, that on cutting or tying up the artery, the muſcle in the ſame manner loſes its whole power of action, as if the nerve had been cut or tied up.

Names, number, and diſtinction of the MUSCLES. The muſcles generally receive their names from their fixed and moveable points, conjointly; ſometimes from the fixed point only; and ſometimes, only from the moveable point: ſome of them alſo are denominated from their uſes; and ſome from their figure, or reſemblance to other things: and, finally, ſome from their ſize, ſituation, or other qualities, as will appear in our deſcription of each of them under its proper article.

As to the number of the muſcles in the human body, authors are ſtrangely diſagreed about it: however, they are certainly, ſays Heiſter, more than five hundred; the principal ones whereof are repreſented in two plates; thoſe conſpicuous in the fore-part of the human body, being expreſſed in plate CLXXXIV. fig. 1. where 1. 1. are the frontal muſcles; 2. 2. the orbiculares palpebrarum; 3. the attollens auriculam; 4. the temporalis; 5. the maſſeter; 6. repreſents the muſcle called, by Lanciſi, conſtrictor, or depreſſor pinnæ narium; 7. the dilatator alæ naſi; 8. the zygomaticus; 9. the place of the elevator labiorum, or elevator labiorum communis, called, by Lanciſi, gracilis; 10. the elevator labii ſuperioris proprius; 11. 11. the conſtrictor, or ſphincter labiorum, or orbicularis labiorum; by ſome called oſculatorius; 12. the buccinator; 13. 13. the muſculi maſtoidei; 14. 14. the ſterno-hyoidei;

hyoidei; 15. 15. thoſe parts of theſe muſcles which ariſe from the clavicle; 16. 16. the coracohyoidei; 17. the ſcaleni; 18. repreſents part of the cucullaris on the right ſide; 18. on the left ſide, is the levator, or elevator ſcapulæ, otherwiſe called muſculus patientiæ; 19. 19. the place where the fibres of the pectoralis unite, in ſome meaſure, with thoſe of the deltoides; 20. 20. the deltoides; 21. the place in the carpus, where the palmaris longus paſſes through a ring in the annular ligament; 22. a remarkable union of the tendons of the extenſors of the three laſt fingers; 23. 23. the productions of the peritonæum, which, perforating the muſcles of the abdomen at the rings, deſcend to the ſcrotum; 24. 24. the place where the three tendons of the ſartorius, gracilis, and ſeminervoſus are inſerted into the anterior and internal part of the tibia, juſt under the knee; 25. 25. the tendons of the extenſors of the toes, which are ſecured by a ligament at the ancle, as appears on both ſides; but on the right ſide, internally, another ligament is repreſented, which fixes the tendons of the extenſor longus digitorum, the tibiæus poſticus, and the flexor pollicis; 26. 26. the muſculus pectoralis; 27. the triceps extenſor cubiti on the right ſide; 28 and 30. the biceps on the left ſide, according to Lancifi's explication; 29. part of the triceps extenſor on the left ſide; 30. the biceps on the right ſide; 31. the brachiæus internus; 32. the anconæus; 33. the pronator rotundus; 34. 34. the ſupinator longus; 35. 35. the radius externus, according to Lancifi; 36. the extenſor carpi ulnaris; 37. 37. the cubitæus internus, according to Lancifi; 38. the radius internus, according to Lancifi; 39. the palmaris with its tendinous expanſion; 40. 40. the tendons of the muſcles of the thumb; 41. the tendon of the adductor pollicis; 42. the extenſor magnus digitorum; 43. ligamentum carpi; 44. 44. the tendons of the iliaci interni; 45. the pectinæus; 46. one of the heads of the triceps; 47. 47. the rectus femoris on each ſide; 48. 48. the vaſtus externus on each ſide; 49. 49. the vaſtus internus on each ſide; 50. the gracilis; 51. the ſeminervoſus; 52. the ſartorius on each ſide; 53. a part of the origin of the vaſtus externus; 54. 54. the membranoſus; 55. the tibialis anticus; 56. the gemeli; 57. 57. the ſolæi; 58. the tendo achilis; 59. according to Lancifi, is the extenſor digitorum longus; 60. 60. the tendons of the extenſors of the toes; 61. the tendons of the extenſor longus, tibiæus poſticus, and flexor pollicis; A. A. portions of the latiſſimus dorſi on each ſide; B. B. the indentations of the ſerratus major anticus; C. C. the ſternum.

Plate CLXXXV. fig. 1. repreſents the muſcles of the back-part of the human body; where 1. 1. expreſs the two muſcles upon the occiput, called, by Euſtachius, quadrati; 2. the muſculus cucullaris; 3. the ſplenius; 4. the muſculus maſtoideus; 5. the muſculus patientiæ, or levator ſcapulæ proprius; 6. the rhomboides; 7. the articulation of the clavicle with the ſcapula on the right ſide; 8. the deltoides; 9. the teres minor; 10. the teres major; 11. 11. the latiſſimus dorſi on each ſide; 12. the glutæus major; 13. the glutæus medius; 14. the muſculus pyriformis; 15. the quadratus femoris; 16. the biceps femoris; 17. the ſemimembranoſus; 18. the membranoſus, according to Lancifi; 19. 19. the vaſti externi; 20. the gaſtrocnemii; 21. the ſoleus; 22. the plantaris.

MUSCLE, *mytulus*, in natural hiſtory, a ſhell compoſed of two valves, of an oblong figure, and ſhutting cloſe all the way; the valves are both convex, and of a ſimilar ſhape: and the animal inhabiting it is called a tethys. See the article TETHYS.

Of the numerous ſpecies of muſcles, ſome are of a conic figure; others oblong, and equal at both extremities, called by many tellinæ; ſome are ſmooth on the ſurface, others rough; and, finally, ſome are much deeper than others.

To this genus belongs the pinna marina, or ovato-conic, great ſtriated, and rugoſe ſea-muſcle: it is one of the largeſt of the bivalve ſhells, being frequently two feet long, and near one broad. The other ſpecies of muſcles are numerous, and are called, by authors, pinnæ marinæ, muſculi, and tellinæ.

MUSCOVY-GLASS, in natural hiſtory, the white ſhining ſpecularis with large and broad leaves, otherwiſe called iſinglaſs. See the article SPECULARIS.

MUSCULAR, or MUSCULOUS, in anatomy, ſomething relating to, or partaking of the nature of a muſcle. See the article MUSCLE.

From the ſubclavians, ariſe the muſcular arteries of the neck, which are uncertain both

both in their number and ſituation, and are diſtributed through the muſcles of the neck.

There are alſo muſcular veins of the neck, which are either ſuperior or inferior, ariſing alſo from the ſubclavian veins.

MUSEUM, a name which originally ſignified a part of the palace of Alexandria, which took up at leaſt one fourth of that city. This quarter was called the Muſeum, from its being ſet apart for the muſes and the ſtudy of the ſciences. Here were lodged and entertained the men of learning, who were divided into many companies or colleges, according to the ſciences of which they were the profeſſors; and to each of theſe houſes or colleges was allotted a handſome revenue. The foundation of this eſtabliſhment is attributed to Ptolemy Philadelphus, who here placed his library. Hence the word muſeum is now applied to any place ſet apart as a repoſitory for things that have an immediate relation to the arts.

The Muſeum at Oxford, called the aſhmolean Muſeum, is a noble pile of building, erected at the expence of the univerſity, at the weſt end of the theatre, at which ſide it has a magnificent portal, ſuſtained by pillars of the corinthian order. The front, which is to the ſtreet, extends about ſixty feet, where there is this inſcription over the entrance, in gilt characters, *Muſeum Aſhmoleanum, ſchola naturalis hiſtoriæ, officina chymica.*

It was begun in 1679, and finiſhed in 1683, when a valuable collection of curioſities was preſented to the univerſity by Elias Aſhmole, eſq. which were the ſame day repoſited there. And ſeveral acceſſions have been ſince made to the muſeum; among which are hieroglyphics and other egyptian antiquities, an entire mummy, roman antiquities, altars, medals, lamps, &c. and a variety of natural curioſities.

The britiſh Muſeum in London is a large, beautiful and magnificent building, and the nobleſt cabinet of curioſities in the world. This edifice was erected in 1677, and was called Montague-houſe, from having been the town-reſidence of the dukes of Montague. In the year 1753, the britiſh parliament having paſſed an act for purchaſing the Muſeum of the late Sir Hans Sloane, and the collection of manuſcripts of the late lord Oxford, called the Harleian Library, for the uſe of the public; 26 truſtees were appointed and incorporated, to provide a repoſitory for theſe and ſome other collections, which repoſitory was to be called the Britiſh Muſeum. Theſe truſtees elected fifteen other truſtees, and having bought Montague-houſe, fitted it up for the reception of theſe collections; they alſo appointed officers to ſuperintend the Muſeum, and having ordained certain ſtatutes with reſpect to viewing the collection contained in it, the public were admitted to view it in 1757.

MUSES, certain fabulous divinities amongſt the pagans, ſuppoſed to preſide over the arts and ſciences: for this reaſon it is uſual for the poets, at the beginning of a poem, to invoke theſe goddeſſes to their aid. Some reckon the muſes to be no more than three, *viz.* Mneme, Acœde, and Melete; that is, memory, ſinging, and meditation: but the moſt antient authors, and particularly Homer and Heſiod, reckon nine; *viz.* Clio, which means glory; Euterpe, pleaſing; Thalia, flouriſhing; Melpomene, attracting; Terpſichore, rejoicing the heart; Erato, the amiable; Polyhymnia, a multitude of ſongs; Urania, the heavenly; and Calliope, ſweetneſs of voice. To Clio, they attributed the invention of hiſtory; to Melpomene, tragedy; to Thalia, comedy; to Euterpe, the uſe of the flute; to Terpſichore, the harp; and to Erato, the lyre and lute; to Calliope, heroic verſe; to Urania, aſtrology; and to Polyhymnia, rhetoric.

The muſes are painted young, handſome, and modeſt; agreeably dreſſed, and crowned with flowers. Their buſineſs was to celebrate the victories of the gods, and to inſpire and aſſiſt the poets: hence the cuſtom of invoking their aid at the beginning of a poem. It muſt not, however, be imagined, that the antient poets themſelves ever conſidered the deities thus invoked, as divine perſons from whom they expected any real help. Their addreſſes to the muſes are mere allegories, and manners of expreſſing themſelves poetically, as when they make gods of ſleep, of fame, of virtue; and other natural and moral things; under the name of muſe they prayed for the genius of poetry, and all the talents neceſſary for a happy execution of what they had undertaken.

MUSHROOM, *fungus*, in botany, a genus of imperfect plants, compoſed of a pedicle, crowned with a broad head, convex

Fig. 1. MUSCLES of the Back part of the Human Body

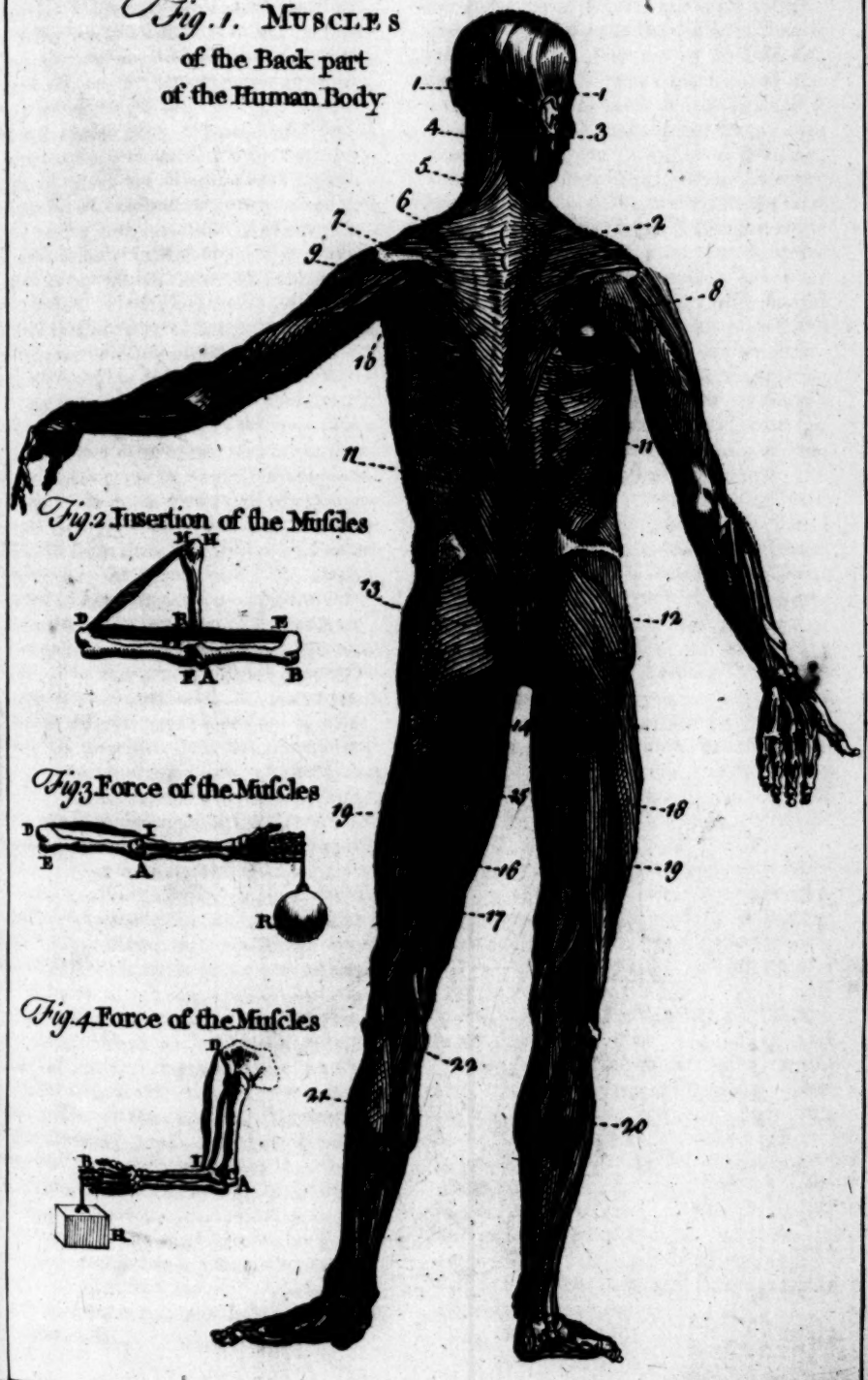


Fig. 2 Insertion of the Muscles

Fig. 3 Force of the Muscles

Fig. 4 Force of the Muscles

T. Jefferys sculp

BRITISH MUSEUM

convex and ſmooth at the top; and hollow, foliated, lamellated, or fiſtulous on the under ſide.

Muſhrooms are by many ſuppoſed to be produced from the putrefaction of the dung in which they are found; but notwithſtanding this notion is pretty generally received among the unthinking part of mankind, yet, by the curious naturaliſts, they are eſteemed real plants; for they have a regular root, a ſtalk conſiſting of ſeveral arrangements of fibres, the interſtices of which are filled up with a parenchymatous ſubſtance, leading from the root to the head or umbel, the underſide of which is full of lamellæ or chives, every one of which is a regular pod or ſeed-veſſel. If theſe lamellæ are examined in their ſeveral ſtates, the ſeeds in them may be eaſily diſcovered, and are always found to be of a ſize and degree of maturity proportioned to the ſtate of the plant: they have each of them alſo a ſiliquaceous aperture lengthwiſe, the ſeeds lying in rows ready to fall through it. The plant is eaſily and regularly propagated through theſe, and may not only be raiſed from ſeed, but like many other plants, may be propagated by roots; the ſeveral filaments at the root producing tubercles, in the manner of the potatoe; from each of which there will ariſe new roots, and a new plant. Hence, like other vegetables, they are annually propagated by the gardeners near London for ſale. We ſhall therefore deſcribe the method of cultivating them; but as there are ſeveral unwholeſome ſorts, we ſhall firſt give a ſhort deſcription of the true eatable kinds. Theſe at firſt appear of a roundiſh form, like a button, the upper part of which, as alſo the ſtalk, is very white; but being opened, the under part is of a livid fleſh-colour; but the fleſhy part, when broken, is very white: when theſe are ſuffered to remain undiſturbed they will grow to a large ſize, and explicate themſelves almoſt to a flatneſs, and the red part underneath will change to a dark colour.

Mr. Miller directs the following method of cultivating them. If you have no beds of your own that produce them, you ſhould look abroad in rich paſtures, during the months of Auguſt and September, till you find them; and then opening the ground about their roots, you will often find the earth full of ſmall white knobs, which are the off-ſets from the muſhrooms: theſe ſhould be carefully gathered, and preſerved dry with the earth about them. The muſhroom-beds ſhould be made of dung in which there is good ſtore of litter. Theſe beds ſhould be made on dry ground, and the dung being laid upon the ſurface about a foot thick, two feet and a half broad, and of a length in proportion to the quantity of muſhrooms deſired, it ſhould be covered about four inches deep with ſtrong earth; upon this lay more dung, about ten inches thick; then another layer of earth; ſtill drawing in the ſides of the bed, ſo as to form it like the ridge of an houſe, which may be done by three layers of dung and as many of earth. When the bed is finiſhed it ſhould be covered with litter, to keep out the wet and prevent its drying; in this ſituation it may remain eight or ten days, by which time it will be of a proper degree of warmth; the litter ſhould then be taken off, the ſides of the bed ſmoothed, and a covering of light rich earth ſhould be laid over the bed; upon this the ſmall roots or off-ſets of the muſhrooms ſhould be put, placing them two or three inches aſunder; then gently cover them about half an inch thick with the ſame light earth; and again put on the covering of litter. The great ſkill in managing theſe beds, is that of keeping them in a proper temperature of moiſture. By this means muſhrooms may be produced all the year; and when the beds are deſtroyed, the ſurface which contains the duſt and roots of the muſhrooms, ſhould be laid by in a dry place for a freſh ſupply, till the proper time of uſing it.

MUSIC, is one of the ſeven ſciences, commonly called liberal, and comprehended alſo among the mathematical, as having for its object diſcrete quantity or number, but not conſidering it in the abſtract like arithmetic, but in relation to time and ſound, in order to make a delightful harmony: or, it is the art of diſpoſing and conducting ſounds conſidered as acute and grave; and proportioning them among themſelves, and ſeparating them by juſt intervals pleaſing to the ſenſe.

Mr. Malcolm defines it a ſcience that teaches how ſound, under certain meaſures of time and tune, may be produced; and ſo ordered and diſpoſed, as either in conſonance (*i. e.* joint-ſounding) or ſucceſſion, or both, they may raiſe agreeable ſenſations.

From this definition, the ſcience naturally divides into two general parts, *viz.* ſpeculative and practical.

The firſt is the knowledge of the materia muſica, or how to produce ſounds in ſuch relations of time and tune as ſhall be agreeable in conſonance or ſucceſſion, or both. By which we do not mean the actual production of theſe ſounds by an inſtrument or voice, but the knowledge of the various relations of tune and time, which are the principles out of which the pleaſure ſought is derived.

The ſecond is how the principles are to be applied, or how ſounds in the relation they bear to muſic (as thoſe are determined in the firſt part) may be ordered, and variouſly put together in ſucceſſion and conſonance, ſo as to anſwer the end. And this is what we call the art of compoſition, which is properly the practical part of muſic.

Some add a third branch, *viz.* the knowledge of inſtruments; but as this depends altogether on the firſt, and is only the application and expreſſion of it, it cannot regularly come under the definition, and conſequently is no part or diviſion of the ſcience.

The firſt branch, which is the contemplative part, divides itſelf into two; the knowledge of the relations and meaſures of time, and the doctrine of time itſelf.

The former is properly what the antients called harmonics, or the doctrine or harmony in ſounds, as containing an explication of the grounds, with the various meaſures and degrees of the agreement of ſounds in reſpect of their tune.

The latter part is what they called rhythmica, becauſe it treats of the numbers of ſounds or notes, with reſpect to time; containing an explication of the meaſures of long and ſhort, quick and ſlow, in the ſucceſſion of ſounds.

The ſecond part, which is the practical part, as naturally divides itſelf into two, anſwering to the parts of the firſt.

That which anſwers to harmonics, the antients called melopœia, becauſe it contains the rules of making ſongs, with reſpect to tune and harmony of ſounds. Mr. Malcolm ſays, we have no reaſon to think the antients had any ſuch thing as compoſition in parts. That which anſwers to rhythmica, they called rhythmopœia; containing rules for the application of numbers and tune.

We find a ſtrange diverſity in antient writers, as to the nature, office, extent, diviſion, &c. of muſic.

The name is ſuppoſed originally formed of *muſa*, muſe; the muſes being ſuppoſed to be the inventors thereof; Kercher, however, will have it take its name from an egyptian word, as ſuppoſing its reſtauration after the flood to have begun there, by reaſon of the reeds on the banks of the river Nile. Heſychius tells us, the Athenians gave the name of muſic to every art.

What in the proper and limited ſenſe of the word is called muſic, has for its object motion, conſidered as under certain regular meaſures and proportions, by which it affects the ſenſes in an agreeable manner. Now as motion belongs to bodies, and as ſound is the effect of motion, and cannot be without it, but all motion does not produce ſound; hence this laſt branch of muſic became farther ſubdivded.

Where motion is without ſound, or as it is only the object of ſight, it was either called muſica orcheſtria or ſaltatoria, which contains rules for the regular motions of the body in dancing; or muſica hypocritica, which reſpects the motions and geſtures of the pantomimes.

When the motion is only perceived by the ear, that is, when ſound is the object of muſic, there were three ſpecies, *viz.* harmonics, which conſider the difference and proportions, with reſpect to acute and grave; rhythmica, which reſpects the proportions of ſounds as to time, or the ſwiftneſs or ſlowneſs of their ſucceſſion; and metrica, which belongs properly to poets, and reſpects the art of making verſes: theſe are the principles which Alypius allows of.

Ariſtides, Quintilianus, Bacchius, and other antient writers, define muſic the knowledge of ſinging, and things belonging thereto; which they call the motions of the voice and body; as if ſinging itſelf conſiſted only in the different tone of the voice. The ſame authors, conſidering muſic in the largeſt ſenſe of the word, divide it into contemplative and active; the firſt, ſay they, is either natural or artificial. The natural is either arithmetical, becauſe it conſiders the proportions of numbers; or phyſical, which examines the order of the things of nature.

The artificial they divide as above, into harmonics, rhythmica, and metrica.

The

The active, which is the application of the artificial, is either enunciative, as in oratory; organical, or inſtrumental performance; odical, for the voice and ſinging of pſalms; hypocritical, in the motions of the pantomimes; to which ſome add hydraulic, though in reality no more than a ſpecies of organical, in which water is uſed for the producing and modifying of ſounds. The muſical faculties, as they call them, are melopoeia, which gives rules for the tones of the voice or inſtrument, and rhythmopoeia, for motions; as alſo poëſis, for making verſes.

Muſic appears to have been one of the moſt antient arts, and of all others vocal muſic muſt undoubtedly have been the firſt kind; for man had not only the various tones of his own voice to make his obſervations on, before any other art or inſtrument was found out, but had the various ſtrains of birds to give him occaſion to improve his own voice, and the modulations of ſounds it was capable of. Of the many antient writers who agree in this conjecture, we ſhall only mention Lucretius, who ſays,

At liquidas avium voces imitarier ore,
Ante fuit multo quam levia carmina cantu,
Concelebrare homines poſſent auriſque juvare.

The firſt invention of wind-inſtruments he aſcribes to the obſervation of the winds blowing in hollow reeds.

We might here add another teſtimony of the antiquity of this art from the Holy Bible, which ſays, that Jubal the ſixth from Adam was the father of ſuch as handle the harp and organ.

As for the other kinds of inſtruments, there were ſo many occaſions for cords and ſtrings, that men could not be long in obſerving their various ſounds, which might give riſe to ſtringed inſtruments. And for pulſatile inſtruments, as drums, and cymbals, they might ariſe from the obſervation of the hollow noiſe of concave bodies.

Plutarch, in one place, aſcribes the invention of muſic to the god Apollo, and in another to Amphion, ſon of Jupiter and Antiope: this laſt, however, is pretty generally allowed to be the firſt who brought muſic into Greece, and to have been the firſt inventor of the lyra. The time he lived is not agreed upon.

To him ſucceeded Chiron, the demigod; Demodocus, Hermes Triſmegiſtus, Olympus, Orpheus, whom ſome make the firſt introducer of muſic into Greece, and the inventor of the lyra; Phenicius Terpander, who was cotemporary with Lycurgus, and ſet his laws to muſic, to whom ſome attribute the firſt inſtitution of muſical modes, and of the lyre; Thales and Thamyris, who is ſaid to have been the firſt inventor of muſic without ſinging. Theſe were eminent muſicians before Homer's time. Others of later date were Laſus Hermionenſis, Melnypides, Philoxenus, Timotheus, Phrynnis, Epigonius, Lyſander, Simmicus, and Diodorus, who were all conſiderable improvers of muſic. Laſus is ſaid to have been the firſt author who wrote on muſic; he lived in the time of Darius Hyſtaſpes. Epigonius invented an inſtrument with forty ſtrings, called epigonium: Simmicus alſo invented one with thirty-five ſtrings, called ſimmicium: Diodorus improved the tibia, by adding new holes, and Timotheus the lyre, by adding a new ſtring; for which he was fined by the Lacedemonians.

As the accounts we have of the inventors of muſical inſtruments among the antients, are very obſcure, ſo alſo are the accounts what thoſe inſtruments were; we ſcarce know any thing of them beſides their names.

The general diviſion of inſtruments, is into the ſtringed inſtruments, wind-inſtruments, and thoſe of the pulſatile kind.

Of ſtringed inſtruments, we hear of the lyra or cythara, pſaltery, trigon, ſambucus, magade, barbiton, pectis, teſtudo, epigonium, ſimmicium, and pandoron, which were all ſtruck with the fingers or plectra.

Of wind-inſtruments, we hear of the tibia, fiſtula, hydraulic and other organs, tubæ, cornua, and lituus.

Of the pulſatile inſtruments, we hear of the tympanum, cymbalum, crepitaculum, tintinabulum, crotalum and ſyſtrum.

Muſic has been in the higheſt eſteem in all ages, and among all people; nor could authors expreſs their opinions of it ſtrongly enough, but by inculcating that it was in heaven, and was one of the principal entertainments of the gods, and the ſouls of the bleſſed.

The effects aſcribed to it by the antients, are almoſt miraculous; by means hereof diſeaſes have been cured, unchaſtity corrected, ſeditions quelled, paſſions raiſed and calmed, and even madneſs occaſioned.

Athenæus aſſures us, that antiently all

laws divine and civil, exhortations to virtue, the knowledge of divine and human things, lives and actions of illuſtrious perſons, were writ in verſe, and publicly ſung by a chorus to the ſound of inſtruments; which was found the moſt effectual means to impreſs morality, and a right ſenſe of duty on the mind.

Dr. Wallis has endeavoured to account for the ſurpriſing effects aſcribed to the antient muſic, and charges them principally on the novelty of the art, and the hyperboles of the antient writers; nor does he doubt but the modern muſic, *cæteris paribus*, would produce effects as conſiderable as that of the antients: the truth is, we can match moſt of the antient ſtories in this kind, in the modern hiſtories; if Timotheus could excite Alexander's fury with the phrygian ſound, and ſooth him into indolence with the lydian, a more modern muſician is ſaid to have driven Eric king of Denmark into ſuch a rage, as to kill his beſt ſervants. Dr. Newenteit tells us of an Italian, who by varying his muſic from briſk to ſolemn, and ſo *vice verſa*, could move the ſoul ſo as to cauſe diſtraction and madneſs. And Dr. South has founded his poem, called Muſica Incantans, on an inſtance he knew of the ſame thing. Derham, in his Phyſico Theology, makes mention of many other things equally ſurpriſing with the inſtances above recited.

There is a great diſpute among the learned, whether the antients or moderns beſt underſtood and practiſed muſic; ſome maintaining that the antient art of muſic, by which ſuch wonderful effects were performed, is quite loſt; and others, that the true ſcience of harmony is now arrived to much greater perfection, than was known or practiſed among the antients.

The antient muſical notes were very myſterious and perplexed. Boëtius and Gregory the great, firſt put them into a more eaſy and obvious method. It was in the year 1204, that Guido Aretine, a benedictine fryar of Auretium in Tuſcany, firſt introduced the uſe of the ſtaff with five lines, on which with the ſpaces he marked his notes, by ſetting a point up and down upon them, to denote the riſe and fall of the voice; tho' Kercher mentions this artifice to have been in uſe long before Guido's time. Another contrivance of Guido's was to apply the ſix muſical ſyllables, *ut*, *re*, *mi*, *fa*, *ſol*, *la*, which he took out of St. John the baptiſt's hymn. Beſides his notes of muſic, by which, according to Kercher, he diſtinguiſhed the tones or modes, and the ſeats of the ſemitones, he alſo invented the ſcale, and ſeveral muſical inſtruments, called poly plectra, as ſpinnets and harpſicords.

The next conſiderable improvement was in the year 1330, when Jean De Muris, doctor of Paris, invented the different figures of notes, which expreſs the times or length of every note, at leaſt their relative proportions to one another, now called longs, breves, ſemi-breves, crotchets, quavers, ſemiquavers, and demiſemiquavers, which ſee under their reſpective articles.

Guido Aretine is alſo ſaid to be the firſt who invented and brought ſymphony or concert into muſic; but what progreſs he made, and what were his compoſitions, we do not know. In ſhort, we may venture to affirm from the whole of what we find wrote on this ſubject, that muſic did not begin to arrive at any tolerable perfection, till towards the end of the laſt century, when the great Purcel and Corelli obliged the world with their moſt agreeable and harmonical compoſitions; then it was that muſic began to advance a-pace, and receive various improvements from many other ingenious compoſers and performers of ſeveral european nations, eſpecially the Italians and Engliſh, and now ſeems brought near its utmoſt perfection; ſince all the agreeable combinations of the various continuance, riſing, falling, and mixtures of tones, muſt be contained within certain limits, whoſe number may not be ſo great as is generally imagined; and becauſe of the great number of perſons who have for more than thirty years laſt paſt, applied themſelves to this art: among whom the excellent Mr. Handel himſelf, deſervedly named the prince of muſicians, both for his compoſition and performance upon the organ and harpſicord, has abundantly and wonderfully performed his part.

MUSK, a dry, light, and friable ſubſtance, of a dark blackiſh colour, tinged with purple; it is a kind of perfume of a very ſtrong ſcent, and only agreeable when in a very ſmall quantity, or moderated by the mixture of ſome other perfume. It is found in a kind of bag or tumour which grows under the belly of a wild beaſt

beaſt called moſchus. See MOSCHUS. Muſk is brought to us ſewed up in a kind of bladders or caſes of ſkin of the bigneſs of a pigeon's egg, or larger, each containing from two or three drams to an ounce of muſk. Theſe are covered with a browniſh hair, and are the real capſules in which the muſk is lodged while on the animal. That which is unadulterated appears in maſſes, of looſe and friable granules, which are ſoft to the touch, and eaſily crumble between the fingers, feeling ſomewhat ſmooth and unctuous.

Muſk taken inwardly produces eaſe from pain, quiet ſleep, and a copious diaphoreſis: hence it has been found of great uſe in ſpaſmodic diſorders, petechial, malignant, putrid fevers, the jail-diſtemper, hiccoughs, *&c.* and Dr. Wall obſerves, that it has been found uſeful in ſpaſmodic diſorders, given by way of clyſter. The operation of muſk in ſome reſpects reſembles that of opium; but it does not leave behind it any ſtupor or languidneſs, which the latter often does. Muſk likewiſe ſeems likely to anſwer in thoſe low caſes where ſleep is much wanted, and opiates are improper. It is ſaid to be beſt given in a bolus, in which form thoſe who are moſt averſe to perfumes, may take it without inconvenience. Fifteen grains or more are now given in a doſe with great ſucceſs.

MUSK-HOG, *Tajacu.* See TAJACU.

MUSK-ANIMAL, *Moſchus.* See the article MOSCHUS.

MUSK-*ſeed*, in botany, the Engliſh name of that ſpecies of hibiſcus, called by botaniſts the abelmoſch. See HIBISCUS.

MUSK-JULEP. See the article JULEP.

MUSKET, a fire-arm borne on the ſhoulder, and uſed in war. The length of a musket is fixed at three feet eight inches from the muzzle to the pan, and it carries a ball of ſixteen to the pound.

In fortification, the length of the line of defence is limited by the ordinary diſtance of a musket-ſhot, which is about 120 fathoms; and the length of almoſt all military architecture is regulated by this rule.

Muſkets, beſides the ordinary duty on iron, pay on importation 1 s. $11\frac{10}{100}$ d. each; and draw back, on exportation, 1 s. $8\frac{25}{100}$ d. but they are not to be imported without licence.

MUSKET-BASKETS, in fortification. See the article BASKETS *of earth.*

MUSKETOON, a kind of ſhort thick muſket, whoſe bore is the thirty-eighth part of its length: it carries five ounces of iron, or ſeven and a half of lead, with an equal quantity of powder. This is the ſhorteſt ſort of blunderbuſſes. See the article BLUNDERBUSS.

MUSLIN, a fine thin ſort of cotton-cloth, which bears a downy knap on its ſurface. There are ſeveral ſorts of muſlins brought from the Eaſt-Indies, and more particularly from Bengal; ſuch as doreas, betelles, mulmuls, tanjeebs, *&c.*

Muſlins, on their importation, pay a duty of 2 s. $10\frac{20}{100}$ d. the piece, which is drawn back on exportation; and beſides this, a duty of 15 l. *per cent.* to be computed according to the groſs price at which they are publicly ſold by auction: but if they are exported, all drawn back is for 20 s. value.

MUSSÆNDA, in botany, a genus of the pentandria monogynia claſs of plants, the corolla of which conſiſts of a funnel-ſhaped petal; the fruit is oval, oblong, ſucculent, and coronated; and the ſeeds are numerous, and arranged into four ſeries.

MUSSELBOROUGH, a port-town of Scotland, in the ſhire of Lothian, ſix miles eaſt of Edinburgh.

MUSTARD, *ſinapi*, in botany. See the article SINAPI.

MUSTELA, in zoology, a genus of quadrupeds of the order of the feræ, the upper foreteeth of which are ſtraight, diſtinct, and acute; the foreteeth of the lower jaw are obtuſe and cluſtered, two of them ſtand inward; the feet are made for climbing.

This genus comprehends the gulo, the martin, the pole-cat, the weaſel, the ferret, the ermin, the ſable, the genet, the tabbied mungo, and the brown mungo. See the article GULO, *&c.*

MUSTELA, or the FOSSIL MUSTELA, in ichthyology, is alſo the name of the blue cobitis, with five longitudinal black lines on each ſide. See the article COBITIS.

This is a ſpecies very ſingular in its manner of living, as well as in its figure; it is five inches long, and ſomewhat more than half an inch in diameter; the head is ſhort, broad, and obtuſe; the belly is ſmooth, and of a bluiſh colour, with ten longitudinal lines running down it, five on each ſide of the back; about the mouth is placed a number of whitiſh ſlender

laws divine and civil, exhortations to virtue, the knowledge of divine and human things, lives and actions of illuſtrious perſons, were writ in verſe, and publicly ſung by a chorus to the ſound of inſtruments; which was found the moſt effectual means to impreſs morality, and a right ſenſe of duty on the mind.

Dr. Wallis has endeavoured to account for the ſurpriſing effects aſcribed to the antient muſic, and charges them principally on the novelty of the art, and the hyperboles of the antient writers; nor does he doubt but the modern muſic, *cæteris paribus*, would produce effects as conſiderable as that of the antients: the truth is, we can match moſt of the antient ſtories in this kind, in the modern hiſtories; if Timotheus could excite Alexander's fury with the phrygian ſound, and ſooth him into indolence with the lydian, a more modern muſician is ſaid to have driven Eric king of Denmark into ſuch a rage, as to kill his beſt ſervants. Dr. Newenteit tells us of an Italian, who by varying his muſic from briſk to ſolemn, and ſo *vice verſa*, could move the ſoul ſo as to cauſe diſtraction and madneſs. And Dr. South has founded his poem, called Muſica Incantans, on an inſtance he knew of the ſame thing. Derham, in his Phyſico Theology, makes mention of many other things equally ſurpriſing with the inſtances above recited.

There is a great diſpute among the learned, whether the antients or moderns beſt underſtood and practiſed muſic; ſome maintaining that the antient art of muſic, by which ſuch wonderful effects were performed, is quite loſt; and others, that the true ſcience of harmony is now arrived to much greater perfection, than was known or practiſed among the antients.

The antient muſical notes were very myſterious and perplexed. Boëtius and Gregory the great, firſt put them into a more eaſy and obvious method. It was in the year 1204, that Guido Aretine, a benedictine fryar of Auretium in Tuſcany, firſt introduced the uſe of the ſtaff with five lines, on which with the ſpaces he marked his notes, by ſetting a point up and down upon them, to denote the riſe and fall of the voice; tho' Kercher mentions this artifice to have been in uſe long before Guido's time. Another contrivance of Guido's was to apply the ſix muſical ſyllables, *ut, re, mi, fa, ſol, la*, which he took out of St. John the baptiſt's hymn. Beſides his notes of muſic, by which, according to Kercher, he diſtinguiſhed the tones or modes, and the ſeats of the ſemitones, he alſo invented the ſcale, and ſeveral muſical inſtruments, called poly plectra, as ſpinnets and harpſicords.

The next conſiderable improvement was in the year 1330, when Jean De Muris, doctor of Paris, invented the different figures of notes, which expreſs the times or length of every note, at leaſt their relative proportions to one another, now called longs, breves, ſemi-breves, crotchets, quavers, ſemiquavers, and demiſemiquavers, which ſee under their reſpective articles.

Guido Aretine is alſo ſaid to be the firſt who invented and brought ſymphony or concert into muſic; but what progreſs he made, and what were his compoſitions, we do not know. In ſhort, we may venture to affirm from the whole of what we find wrote on this ſubject, that muſic did not begin to arrive at any tolerable perfection, till towards the end of the laſt century, when the great Purcel and Corelli obliged the world with their moſt agreeable and harmonical compoſitions; then it was that muſic began to advance a-pace, and receive various improvements from many other ingenious compoſers and performers of ſeveral european nations, eſpecially the Italians and Engliſh, and now ſeems brought near its utmoſt perfection; ſince all the agreeable combinations of the various continuance, riſing, falling, and mixtures of tones, muſt be contained within certain limits, whoſe number may not be ſo great as is generally imagined; and becauſe of the great number of perſons who have for more than thirty years laſt paſt, applied themſelves to this art: among whom the excellent Mr. Handel himſelf, deſervedly named the prince of muſicians, both for his compoſition and performance upon the organ and harpſicord, has abundantly and wonderfully performed his part.

MUSK, a dry, light, and friable ſubſtance, of a dark blackiſh colour, tinged with purple; it is a kind of perfume of a very ſtrong ſcent, and only agreeable when in a very ſmall quantity, or moderated by the mixture of ſome other perfume. It is found in a kind of bag or tumour which grows under the belly of a wild beaſt

beaſt called moſchus. See MOSCHUS. Muſk is brought to us ſewed up in a kind of bladders or caſes of ſkin of the bigneſs of a pigeon's egg, or larger, each containing from two or three drams to an ounce of muſk. Theſe are covered with a browniſh hair, and are the real capſules in which the muſk is lodged while on the animal. That which is unadulterated appears in maſſes, of looſe and friable granules, which are ſoft to the touch, and eaſily crumble between the fingers, feeling ſomewhat ſmooth and unctuous.

Muſk taken inwardly produces eaſe from pain, quiet ſleep, and a copious diaphoreſis: hence it has been found of great uſe in ſpaſmodic diſorders, petechial, malignant, putrid fevers, the jail-diſtemper, hiccoughs, *&c.* and Dr. Wall obſerves, that it has been found uſeful in ſpaſmodic diſorders, given by way of clyſter. The operation of muſk in ſome reſpects reſembles that of opium; but it does not leave behind it any ſtupor or languidneſs, which the latter often does. Muſk likewiſe ſeems likely to anſwer in thoſe low caſes where ſleep is much wanted, and opiates are improper. It is ſaid to be beſt given in a bolus, in which form thoſe who are moſt averſe to perfumes, may take it without inconvenience. Fifteen grains or more are now given in a doſe with great ſucceſs.

MUSK-HOG, *Tajacu.* See TAJACU.

MUSK-ANIMAL, *Moſchus.* See the article MOSCHUS.

MUSK-*ſeed*, in botany, the Engliſh name of that ſpecies of hibiſcus, called by botaniſts the abelmoſch. See HIBISCUS.

MUSK-JULEP. See the article JULEP.

MUSKET, a fire-arm borne on the ſhoulder, and uſed in war. The length of a musket is fixed at three feet eight inches from the muzzle to the pan, and it carries a ball of ſixteen to the pound.

In fortification, the length of the line of defence is limited by the ordinary diſtance of a musket-ſhot, which is about 120 fathoms; and the length of almoſt all military architecture is regulated by this rule.

Muſkets, beſides the ordinary duty on iron, pay on importation 1 s. $11\frac{10}{100}$ d. each; and draw back, on exportation, 1 s. $8\frac{25}{100}$ d. but they are not to be imported without licence.

MUSKET-BASKETS, in fortification. See the article BASKETS *of earth*.

MUSKETOON, a kind of ſhort thick muſket, whoſe bore is the thirty-eighth part of its length: it carries five ounces of iron, or ſeven and a half of lead, with an equal quantity of powder. This is the ſhorteſt ſort of blunderbuſſes. See the article BLUNDERBUSS.

MUSLIN, a fine thin ſort of cotton-cloth, which bears a downy knap on its ſurface. There are ſeveral ſorts of muſlins brought from the Eaſt-Indies, and more particularly from Bengal; ſuch as doreas, betelles, mulmuls, tanjeebs, *&c.*

Muſlins, on their importation, pay a duty of 2 s. $10\frac{20}{100}$ d. the piece, which is drawn back on exportation; and beſides this, a duty of 15 l. *per cent.* to be computed according to the groſs price at which they are publicly ſold by auction: but if they are exported, all drawn back is for 20 s. value.

MUSSÆNDA, in botany, a genus of the pentandria monogynia claſs of plants, the corolla of which conſiſts of a funnel-ſhaped petal; the fruit is oval, oblong, ſucculent, and coronated; and the ſeeds are numerous, and arranged into four ſeries.

MUSSELBOROUGH, a port-town of Scotland, in the ſhire of Lothian, ſix miles eaſt of Edinburgh.

MUSTARD, *ſinapi*, in botany. See the article SINAPI.

MUSTELA, in zoology, a genus of quadrupeds of the order of the feræ, the upper foreteeth of which are ſtraight, diſtinct, and acute; the foreteeth of the lower jaw are obtuſe and cluſtered, two of them ſtand inward; the feet are made for climbing.

This genus comprehends the gulo, the martin, the pole-cat, the weaſel, the ferret, the ermin, the ſable, the genet, the tabbied mungo, and the brown mungo. See the article GULO, *&c.*

MUSTELA, or the FOSSIL MUSTELA, in ichthyology, is alſo the name of the blue cobitis, with five longitudinal black lines on each ſide. See the article COBITIS.

This is a ſpecies very ſingular in its manner of living, as well as in its figure; it is five inches long, and ſomewhat more than half an inch in diameter; the head is ſhort, broad, and obtuſe; the belly is ſmooth, and of a bluiſh colour, with ten longitudinal lines running down it, five on each ſide of the back; about the mouth is placed a number of whitiſh ſlender

ſlender cirri or beards; the pectoral fins have each eleven rays, the ventral ones five, the dorſal and the pinna ani ſeven. Where the ſhores are ſandy, it will work its way under the ſand to a great diſtance from the water, and is there dug up.

MUSTAGEN, a port-town of Barbary, in the kingdom of Algiers, 140 miles weſt of the city of Algiers.

MUTE, *dumb*, in a general ſenſe, ſignifies a perſon that cannot ſpeak, or has not the uſe of ſpeech.

MUTE, in law, a perſon that ſtands dumb or ſpeechleſs, when he ought to anſwer, or to plead. A priſoner, by our law, is ſaid to ſtand mute ſeveral ways, *viz.* 1. When he does not ſpeak at all, in which caſe it ſhall be inquired whether he ſtands mute out of obſtinacy, or by the act of God. 2. When the priſoner does not plead directly, or will not put himſelf on the inqueſt to be tried; or where he feigns himſelf mad, and refuſes to anſwer upon his trial. 3. A priſoner ſhall be taken as one that ſtands mute, when on his trial he peremptorily challenges above the number of jurors allowed by law. In the crime of high treaſon, if the priſoner ſtands mute, he ſhall forfeit lands and goods in the ſame manner as if he had been attainted. Alſo in felony and petit treaſon, a perſon that ſtands mute ſhall forfeit his lands and goods as on other attainders, though whenever a perſon ſtanding mute is adjudged to his penance for felony, it is held he thereby prevents the attainder which otherwiſe might be incurred, and forfeits only his chattels.

MUTE, in grammar, a letter which yields no ſound without the addition of a vowel. The ſimple conſonants are ordinarily diſtinguiſhed into mutes and liquids, or ſemi-vowels. See the articles CONSONANT, LIQUID, *&c.*

The mutes in the greek alphabet are nine, three of which, *viz.* π, κ, τ, are termed tenues; three, β, γ, δ, termed mediæ; and three, φ, χ, θ, termed aſpirates. See the article ASPIRATE, *&c.*

The mutes of the latin alphabet are alſo nine, *viz.* B, C, D, G, I, K, P, Q, T.

MUTILATION, the retrenching or cutting away any member of the body.

This word is alſo extended to ſtatues and buildings, where any part is wanting, or the projecture of any member, as a corniche or an impoſt is broken off. It is ſometimes alſo uſed, in a more immediate manner, for caſtration. See the article CASTRATION.

MUTUAL, a relative term, denoting ſomething that is reciprocal between two or more perſons: thus we ſay, mutual aſſiſtance, mutual promiſe, mutual love, *&c.*

MUTULE, in architecture, a kind of ſquare modillion ſet under the corniche of the doric order. See DORIC.

The only difference between the mutule and modillion conſiſts in this, that the former is uſed in ſpeaking of the doric order, and the latter in the corinthian. See CORINTHIAN and MODILLION.

MUTUUM, in the civil law, denotes a loan ſimply ſo called; or a contract introduced by the law of nations, whereby a thing conſiſting in weight, as bullion; in number, as money; or in meaſure, as corn, timber, wine, *&c.* is given to another upon condition that he ſhall return another thing of the ſame quantity, nature, and value, on demand. This therefore is a contract without reward, ſo that where uſe or intereſt ariſes, there muſt be ſome particular article in the contract whereon it is founded.

MUXARA, a port-town of Spain, in the province of Granada, ſituated on the Mediterranean, fifty miles ſouth-weſt of Carthagena.

MUYDEN, a town of Holland, ſituated on the ſouth coaſt of the Zuider ſea, ſeven miles eaſt of Amſterdam.

MUZZLE *of a gun or mortar*, the extremity at which the powder and ball is put in; and hence, the muzzle-ring is the metalline circle, or moulding, that ſurrounds the mouth of the piece. See the article GUN.

MYAGRUM, in botany, a genus of the tetradynamia ſiliculoſa claſs of plants, the corolla whereof conſiſts of four plane, roundiſh, obtuſe petals, diſpoſed croſswiſe, and narrower than the ungues. The fruit is a bivalve turbinato-cordated ſmall pod, lightly compreſſed and rigid, with the apex ending in a conical rigid ſtyle; the ſeeds are roundiſh.

MYCONE, one of the iſlands of the Archipelago, about twenty-five miles in circumference, ſituated in eaſt long. 25° 6′, north lat. 37°.

MYLOGLOSSUM, in anatomy, is, according to Heiſter, no more than a part of the mylohyoides, though other anatomiſts make it a diſtinct pair of muſcles, thus called becauſe it ariſes about the backſide of the molares, and is inſerted into

into the ligament of the tongue, helping to pull it upwards; being the ſame with what Cowper calls ſtyloglofſum. See the next article.

MYLOHYOIDÆUS, in anatomy, one of the five pair of muſcles belonging to the os hyoides. The mylohyoidæus ariſes with a large baſe from the bottom of the lower jaw, near the chin, and terminates at the baſe of the os hyoides. See the article HYOIDES.

Beſides the common uſe aſcribed to this muſcle, which is to move the hyoides, the tongue, and the larynx, both upwards, inwards, and ſideways, its ſeries of tranſverſe fibres have a farther uſe, when it is at reſt; and that is to compreſs the glands under the tongue, and by this means promote the diſcharge of the ſaliva into the mouth from the lower ſalival ducts: whence it is we uſe this muſcle, when we want ſaliva in the mouth.

MYLON, in ſurgery, a large kind of ſtaphyloma. See the article STAPHYLOMA.

MYOLOGY, μυολογια, that part of anatomy which treats of the muſcles of the human body. See the article MUSCLE.

MYOMANCY, a kind of divination by means of mice. See DIVINATION.

MYOPIA, or MYOPIAS, ſhort-ſightedneſs, a ſpecies of viſion, wherein objects are ſeen diſtinctly only at ſmall diſtances; which is incident to perſons who have the cornea and cryſtalline, or either of them, too convex.

From this configuration of the eye it is plain, that the diſtinct picture of objects at an ordinary diſtance will fall before the retina; whence the viſion muſt be confuſed and indiſtinct. In order therefore to ſee diſtinctly, they are obliged to bring the objects very nigh to the eyes; by which means the rays being more diverging, are made to converge and meet at the retina; where a diſtinct picture being formed, the object will be ſeen diſtinctly.

They that are ſhort-ſighted never look attentively at thoſe who ſpeak to them, as being unable to obſerve the motion of their eyes, which contributes greatly to explain and enforce their words; and therefore, they are only attentive to the diſcourſe. Short-ſighted perſons need leſs light than others, to ſee diſtinctly; whence they can read the ſmalleſt print, when others are not able to diſtinguiſh one letter from another.

Myopes, or ſhort-ſighted perſons, have their ſight mended by a concave lens, of a due degree of concavity: for the refraction of the rays of light being in ſuch perſons too ſtrong, in proportion to the diſtance of the retina from the cryſtalline, this refraction will be diminiſhed by the interpoſition of ſuch a glaſs, whereby the objects will be ſeen diſtinctly: but as ſuch glaſſes repreſent objects under a leſs angle, they muſt appear leſs than to the naked eye.

Short-ſighted perſons uſually become leſs ſo, as they advance in years; and that becauſe the humours of the eye waſting, the cornea ſhrinks and becomes leſs convex, and the cryſtalline becomes flatter than before; by which means objects are ſeen more diſtinctly, and at greater diſtances, than when the refraction was ſtronger in the more plump and convex eyes. See the article VISION.

MYOSOTIS, MOUSE-EAR, in botany, a genus of the pentandria-monogynia claſs of plants, with a monopetalous flower, ſemiquinquifid at the limb: the ſeeds are four, which are contained in the bottom of the cup.

MYOSURUS, MOUSE-TAIL, in botany, a genus of the pentandria-polygynia claſs of plants, the flower of which conſiſts of five very ſmall petals; and its numerous ſeeds are diſpoſed in an imbricated order upon a receptacle.

MYRIAD, a term ſometimes uſed to denote ten thouſand.

MYRICA, in botany, a genus of the dioecia-tetrandria claſs of plants, without any flower petals: the cup is a ſquama of a lunated figure; and the fruit is a berry, containing only a ſingle ſeed.

MYRIOPHYLLUM, SMALL WATER-MILFOIL, in botany, a genus of the monoecia-polyandria claſs of plants, without any flower petals; and the fruit is compoſed of four naked ſeeds.

MYRISTICA, the NUTMEG-TREE, a genus of trees, the characters of which are not fully aſcertained: it is ſaid to have no flower petals; and its fruit is a drupe, of a roundiſh figure, containing a ſingle ſeed, lightly ſulcated. See NUTMEG.

MYRMECIA, or FORMICA, a painful kind of wart, with a broad baſe, and deeply rooted; growing on the palms of the hands, and ſoles of the feet; for the extirpation of which, ſee the articles WART and EXCRESCENCE.

MYRMECOPHAGA, the ANT BEAR, in zoology, a genus of quadrupeds, of the order of the agriæ, the body of which

is

is covered with hair, and the ears roundish. There are three ſpecies of it; the one, called the great ant-bear, with three toes on the fore-feet, and five on the hinder; another, or leſſer ant-bear, with four toes on the fore-feet, and five on the hinder; and a third, with only two toes on the fore-feet, and four on the hinder.

They are ſo called from feeding on ants, which it does by thruſting out its tongue upon an ant-hill, and drawing it into the mouth when covered with theſe creatures.

MYRMILLONES, in roman antiquity, a kind of gladiators, ſo called from their wearing the myrmillo, a ſort of gallic armour.

MYROBALANS, a kind of medicinal fruit brought from the Indies, of which there are five kinds: 1. the citrine, of a yellowiſh-red, hard, oblong, and the ſize of an olive: 2. the black, or indian myrobalan, of the bigneſs of an acorn, wrinkled, and without a ſtone: 3. chebulic myrobalans, which are of the ſize of a date, pointed at the end, and of a yellowiſh-brown: 4. emblic, which are round, rough, the ſize of a gall, and a dark-brown: and, 5. belleric, which are hard, round, of the ſize of an ordinary prune, leſs angular than the reſt, and yellow. Each of theſe kinds are ſlightly purgative and aſtringent; but Quincy obſerves, that the beſt of them are not worth regarding, ſince they rather clog than aſſiſt any compoſition.

MYRRH, a vegetable production of the gum or reſin-kind, iſſuing by inciſion, and ſometimes ſpontaneouſly, from the trunk and larger branches of a tree growing in Egypt, Arabia, and Abyſſinia. The inciſions are made twice a-year, and the myrrh ouſing out, is received on ruſh-mats diſperſed underneath.

Myrrh is ſent over to us in looſe granules of various ſizes, from that of a pepper-corn, to the bigneſs of a walnut. The generality of them, however, are from the ſize of a pea, to a little more than that of a horſe-bean: theſe are ſometimes roundiſh, but often irregularly long and contorted. The colour of myrrh is a reddiſh brown, with more or leſs of an admixture of yellow, and in the pureſt pieces it is ſomewhat tranſparent. Its taſte is bitter and acrid, with a peculiar aromatic flavour, but very nauſeous: but its ſmell, tho' ſtrong, is not diſagreeable. It is to be choſen in clear pieces, light, friable, and of the bittereſt taſte. Myrrh is of great uſe in medicine; it powerfully reſolves and attenuates thick and viſcid blood, and concreted bile, and glutinous humours, and is good in obſtructions of the menſes, and in infarctions of the viſcera. It alſo promotes delivery and the expulſion of the ſecundines, and is good in aſthmas, and in caſes of tubercles of the lungs: it is of great ſervice in the jaundice and in cachectic complaints: it deſtroys worms, ſtrengthens the ſtomach, and diſſipates flatulencies. Externally applied, it is diſcutient and vulnerary; it cleanſes old ulcers, and diſpoſes them to heal; but it gives many people the head-ach: and as it promotes diſcharges of blood, ſhould never be given to perſons ſubject to ſuch diſcharges, as ſpitting of blood, or the like, or to women in the time of their pregnancy. It is adminiſtered either in pills, boluſes, or tinctures; it not conveniently agreeing with any other forms.

MYRSINE, in botany, a genus of the pentandria-monogynia claſs of plants, the flower of which conſiſts of a ſingle petal, divided into five ſemi-oval, obtuſe, and connivent petals: the fruit is a roundiſh depreſſed berry, containing five cells, with a ſingle ſeed in each.

MYRTIFORM, in anatomy, an appellation given to ſeveral parts, from their reſembling myrtle berries: thus we meet with the myrtiform caruncles, and the myrtiform muſcle of the noſe, which ariſes near the inciſorius of the upper lip, and is inſerted into the alæ of the noſe. See the article CARUNCLE.

MYRTLE, *myrtus*, in botany, a genus of the icoſandria-monogynia claſs of plants, the corolla of which conſiſts of five large, oval, and undivided petals; and its fruit is an oval, trilocular berry, with a ſingle kidney-ſhaped ſeed in each cell.

Myrtle-berries, ſays Quincy, are very rough and aſtringent, not much preſcribed in compoſition for inward uſe; but they enter ſeveral of the ſtrengthening-plaſters: the ſyrup of them is eſteemed good againſt abortion, and in fluxes of all kinds.

MYRTUS, the *myrtle*, in botany. See the article MYRTLE.

MYSIA, the antient name of a province in Aſia, being the north-weſt part of Natolia, or Aſia Minor.

MYSTERY, ſomething ſecret or concealed, impoſſible or difficult to comprehend. All religions, true or falſe, have their myſ-

myſteries. The pagan religion was remarkably full of them. Ovid reckons it a great crime to divulge the myſtic rites of Ceres and Juno. The eleuſinia, or ſacred rites of Ceres, ſolemnized at Eleuſis, were called, by way of eminence, the myſteries; and ſo ſuperſtitiouſly careful were they to conceal theſe ſacred rites, that if any perſon divulged any part of them, he was thought to have called down ſome divine judgment on his head, and it was accounted unſafe to abide under the ſame roof with him; and Horace declares, that he would not put to ſea in the ſame ſhip with one who revealed the myſteries of Ceres. The pagan myſteries, it is true, were generally myſteries of iniquity, and concealed only becauſe their being publiſhed would have rendered their religion ridiculous and odious. Thus the ſacred writings often ſpeak of the infamous myſteries of the pagan deities, in which the moſt ſhameful crimes were committed under the ſpecious veil of religion.

The whole religion of the Egyptians was myſterious from the beginning to the end, and both their doctrines and worſhip wrapped up in ſymbols and hieroglyphics.

The religion of the Jews is ſuppoſed to be full of myſteries. The whole nation, according to St. Auguſtin, was a myſtery, as it repreſented or was a type of the people of Chriſt, and the chriſtian religion. Whatever was commanded or forbidden them was figurative, and their ſacrifices, prieſthood, *&c.* included myſteries. The prophecies concerning Jeſus Chriſt in the jewiſh books, are likewiſe figurative and myſterious.

The chriſtian religion has alſo its myſteries: but in the ſcripture language the word myſtery is uſed with ſome latitude, and denotes whatever is not to be known without a divine revelation, and all the ſecret things which God has diſcovered by his miniſters the prophets, by Jeſus Chriſt and his apoſtles. The myſteries of the chriſtian church are, the incarnation of the Word, the hypoſtatical union of the divine and human nature, the miraculous birth, death, and reſurrection of the ſon of God, the doctrine of the trinity, *&c.* See the article INCARNATION, *&c.*

St. Paul often ſpeaks of the myſteries of the chriſtian religion; as the myſtery of the goſpel, the myſtery of the croſs of Chriſt, the myſtery which was kept ſecret ſince the world began: and he calls the preachers of the goſpel, the ſtewards of the myſteries of God.

MYSTICAL, ſomething myſterious or allegorical. Some of the commentators on the ſacred writings, beſides a literal, find alſo a myſtical meaning. The ſenſe of ſcripture, ſay they, is either that immediately ſignified by the words and expreſſions in the common uſe of language; or it is mediate, ſublime, typical, and myſtical. The literal ſenſe they again divide into proper literal, which is contained in the words taken ſimply and properly; and metaphorical literal, where the words are to be taken in a figurative and metaphorical ſenſe. The myſtical ſenſe of ſcripture they divide into three kinds: the firſt correſponding to faith, and called allegorical; the ſecond to hope, called anagogical; and the third to charity, called the tropological ſenſe. And ſometimes they take the ſame word in ſcripture in all the four ſenſes: thus the word Jeruſalem, literally ſignifies the capital of Judæa; allegorically, the church militant; tropologically, a believer; and anagogically, heaven. So that paſſage in Geneſis, *let there be light, and there was light*, literally ſignifies corporeal light; by an allegory, the Meſſiah; in the tropological ſenſe, grace; and anagogically, beatitude, or the light of glory. See the article ANAGOGICAL, *&c.*

MYSTICS, a religious ſect diſtinguiſhed by their profeſſing a pure, ſublime, and perfect devotion, with an intire diſintereſted love of God, free from all ſelfiſh conſiderations, and by their aſpiring to a ſtate of paſſive contemplation.

MYTHOLOGY, μυθολογια, the hiſtory of the fabulous gods and heroes of antiquity, with the explanations of the myſteries or allegories couched therein. Lord Bacon thinks that a great deal of concealed inſtruction and allegory was originally intended in moſt part of the antient mythology: he obſerves, that ſome fables diſcovers a great and evident ſimilitude, relation, and connection with the thing they ſignify, as well in the ſtructure of the fable, as in the meaning of the names, whereby the perſons or actors are characterized.

The ſame writer thinks it may paſs for a farther indication of a concealed and ſecret meaning, that ſome of theſe fables are ſo abſurd and idle in their narration, as to ſhew an allegory even afar off: but the argument of moſt weight upon this

this ſubject he takes to be this, that many of theſe fables appear by no means to have been invented by the perſons who relate them: he looks on them not as the product of the age, nor invention of the poets, but as ſacred relics, as he terms them, gentle whiſpers, and the breath of better times, that from the tradition of more antient nations, came at length into the flutes and trumpets of the Greeks. He concludes, that the knowlege of the early ages was either great or happy: great if they by deſign made this uſe of trope and figure; or happy, if, whilſt they had other views, they afforded matter and occaſion to ſuch noble contemplations.

MYTULUS, the *muſcle*, in natural hiſtory. See the article MUSCLE.

MYURUS, in medicine, an epithet for a ſort of ſinking pulſe, when the ſecond ſtroke is leſs than the firſt; the third than the ſecond, and ſo on. Of this, there are two kinds; the firſt, when the pulſe ſinks ſo as never to ariſe; the other, when it returns again, and riſes in ſome degree. Both are eſteemed a bad preſage.

N.

N, or n, the thirteenth letter, and tenth conſonant of our alphabet: it is a liquid, the ſound of which is formed by forcing the voice ſtrongly through the mouth and noſtrils; being at the ſame time intercepted by applying the tip of the tongue to the forepart of the palate, with the lips open. It ſuffers no conſonant immediately after it, in the beginning of words and ſyllables; nor any before it, except *g*, *k*, and *s*; as in *gnaw*, *know*, *ſnow*, &c.

As a numeral, N ſtands for 900; and with a daſh over it, thus $\bar{N}$, for 900,000. N, or N°, ſtands for numero, *i. e.* in number; and N. B. for nota bene, note well, or obſerve wel'.

Among the antient Romans, N denotes Nepos, Nonnius, &c. N. C. Nero Cæſar, or Nero Claudius; N. L. Non Liquet; N. P. Notarius Publicus; and N B L. ſtands for nobilis.

NAAM, in law, the detaching or deſtraining a perſon's moveable goods; as where a man takes another man's beaſt for doing damage in his ground; or where it is done in conſequence of another man's act, as when it is agreed, that in default of payment of ſome contract, it ſhall be lawful to diſtrain on lands charged therewith.

NAB, a river which riſes in Franconia, and running through Bavaria, falls into the Danube above Ratiſbon.

NABOB, a viceroy, or governor of one of the provinces of the Mogul's empire, in India. See the article INDIA.

NABONASSAR, or *Æra of* NABONASSAR, a method of computing time from the commencement of Nabonaſſar's reign. See the article EPOCHA.

The epocha of Nabonaſſar is of the greater importance, as Ptolemy and other aſtronomers account their years from it.

NABURG, a town of Germany in the palatinate of Bavaria: eaſt long. 12° 7′, north lat. 49° 22′.

NADAB, the ſovereign pontiff, or high-prieſt of the Perſians, whoſe dignity is the ſame as that of the mufti among the Turks; with this difference only, that the nadab may diveſt himſelf of his eccleſiaſtical office, and paſs to civil employments, which the mufti is not allowed to do. See the article MUFTI.

The nadab takes place next after the atmath-dulet, or prime miniſter; he has two judges under him, called the ſceik and the caſi, who decide all religious matters, grant divorces, and are preſent at contracts and public acts, and theſe have deputies in all the cities of the kingdom.

NADIR, in aſtronomy, that point of the heavens which is diametrically oppoſite to the zenith, or point directly over our heads.

The zenith and nadir are the two poles of the horizon. See HORIZON and POLE.

Sun's NADIR, in aſtronomy, is the axis of the cone formed by the earth's ſhadow: it is thus called, becauſe being produced, it gives a point in the eclip-

tic

tic diametrically oppoſite to the ſun.

NAERDEN, a town of Holland, ſituated at the ſouth-end of the Zuyder-Sea, thirteen miles eaſt of Amſterdam.

NÆVI, in ſurgery, marks or excreſcences made on the ſkin of an infant before its birth, by the imagination of the mother. See the article IMAGINATION.

For the treatment of theſe, ſee the article EXCRESCENCE.

NAHUM, or *the prophecy of* NAHUM, a canonical book of the Old Teſtament.

Nahum, the ſeventh of the twelve leſſer prophets, was a native of Elkoſhai, a little village of Gallilee. The ſubject of his prophecy is the deſtruction of Nineveh, which he deſcribes in the moſt lively and pathetic manner; his ſtyle is bold and figurative, and can hardly be exceeded by the moſt perfect maſters of oratory. This prophecy was verified at the ſiege of that city by Aſtyages, in the year of the world 3378, 622 years before Chriſt.

The time of Nahum's death is unknown: the greek menologies, and the latin martyrologies, place his feſtival on the firſt of December.

NAIADS, in mythology, the nymphs of the fountains. See the article NYMPH.

NAIANT, in heraldry, a term uſed in blazoning fiſhes, when borne in an horizontal poſture, as if ſwimming.

NAJARA, a town of Spain, fifty miles ſouth of Bilboa.

NAJAS, in botany, a genus of the monoecia-monandria claſs of plants, the male corolla of which is monopetalous, and divided into four ſegments at the limb: the femal one has no flower-petals; and the fruit is an oval capſule, containing ovato-oblong ſeeds.

NAIL, *unguis*, in anatomy, a kind of bony excreſcence growing on the fingers and toes of men, and ſeveral other animals. The number, figure, ſize, and colour of the nails need no explanation.

The ſeveral parts of the nails have their ſeveral names: the extremity is called the apex; the oppoſite part of this is the root or baſe: near which there is a white part called the lunula, from its figure ſomewhat reſembling a ſegment of a circle.

As to the ſubſtance of the nails, they are compoſed of the cutaneous papillæ, elongated and indurated, and firmly connected to one another in a longitudinal direction: for this reaſon, they are very ſenſible at the roots, where theſe papillæ are yet tender; but at the apex, where they are perfectly indurated, they may be cut without pain.

The papillæ, of which the nails are formed, ariſe out of the ſkin, not only at the root of the nail, but all over the greater part of its under ſurface. It is by this means that the nails are ſo firmly connected to the ſkin; and it is owing to the continual acceſſion of more and more papillæ, as they approach towards the apex, that they become harder and firmer in that part. They may eaſily be ſeparated intire, from dead ſubjects by hot water.

We are next to enquire into the manner of their nutrition. As the reſt of the papillæ of the cutis have their veſſels, by which they are nouriſhed; ſo alſo the papillæ which form the nails, have their veſſels for conveying nouriſhment to them at the baſe: but as theſe papillæ do not, in their own form, conſtitute the body of the nail, but become indurated as they are elongated, and ſeem only the roots or baſes of hard and rigid fibres; ſo theſe indurated parts of them have fewer than the more tender; but yet enough for their nutrition are continued along them. Their growth is by means of theſe, and it continues as long as the perſon lives. It has been ſaid, that they grow after the perſon is dead; but Heiſter thinks this an error.

The uſes of the nails are, 1. To ſtrengthen and defend the extremities of the fingers and toes, that they may not be ſo eaſily hurt by external accidents as they otherwiſe would have been. 2. To aſſiſt the fingers in the more readily laying hold of little things, and in holding them the more firmly. 3. To be of uſe in cleaning the ſkin from any accidental foulneſſes on its ſurface. 4. On the toes, they ſerve to make us tread the firmer, and to prevent the painful colliſion their ends would otherwiſe be almoſt continually ſubject to.

Among the various animals, the claws, which are perfectly analogous to our nails, ſerve them for ſeizing and tearing their prey, and for climbing trees: the ſquirrels, *&c.* make the latter uſe of them; the beaſts of prey, in general, the former. Among the other animals, the hoofs of ſome ſerve them as ſhoes to walk on; in others, they anſwer both this purpoſe and that of offenſive weapons, as in the horſe, to ſtrike with.

NAILS, in building, *&c.* ſmall ſpikes of

iron, braſs, &c. which being drove into wood, ſerve to bind ſeveral pieces together, or to faſten ſomething upon them. The ſeveral ſorts of nails are very numerous; as 1. back and bottom nails; which are made with flat ſhanks to hold faſt, and not open the wood. 2. Clamp-nails, for faſtening the clamps in buildings, &c. 3. Claſp-nails; whoſe heads claſping and ſticking into the wood, render the work ſmooth, ſo as to admit a plane over it. 4. Clench-nails, uſed by boat and barge-builders, and proper for any boarded buildings that are to be taken down; becauſe they will drive without ſplitting the wood, and draw without breaking; of theſe there are many ſorts. 5. Clout nails, uſed for nailing on clouts to axle-trees. 6. Deck-nails, for faſtening of decks in ſhips, doubling of ſhipping, and floors laid with planks. 7. Dog nails, for faſtening hinges on doors, &c. 8. Flat-points, much uſed in ſhipping, and are proper where there is occaſion to draw and hold faſt, and no conveniency of clenching. 9. Jobent-nails, for nailing thin plates of iron to wood, as ſmall hinges on cupboard-doors, &c. 10. Lead-nails, for nailing lead, leather, and canvas to hard wood. 11. Port-nails, for nailing hinges to the ports of ſhips. 12. Pound-nails, which are four-ſquare, and are much uſed in Eſſex, Norfolk, and Suffolk, and ſcarce any where elſe, except for pailing. 13. Ribbing-nails, principally uſed in ſhip-building, for faſtening the ribs of ſhips in their places. 14. Roſe-nails, which are drawn four ſquare in the ſhank, and commonly in a round tool, as all common two-penny nails are; in ſome countries all the larger ſort of nails are made of this ſhape. 15. Rother-nails, which have a full head, and are chiefly uſed in faſtening rother-irons to ſhips. 16. Round head nails, for faſtening on hinges, or for any other uſe where a neat head is required; theſe are of ſeveral ſorts. 17. Scupper-nails, which have a broad head, and are uſed for faſtening leather and canvas to wood. 18. Sharp-nails; theſe have ſharp points and flat-ſhanks, and are much uſed, eſpecially in the Weſt-Indies, for nailing ſoft wood. 19. Sheathing-nails, for faſtening ſheathing-boards to ſhips. 20. Square-nails, which are uſed for hard wood, and nailing up wall fruit. 21. Tacks, the ſmalleſt of which ſerve to faſten paper to wood; the middling for wool-cards, &c. and the larger for upholſterers and pumps.

Nails are ſaid to be toughened when too brittle, by heating them in a fire-ſhovel, and putting ſome tallow or greaſe among them.

Nails are ſold at ſix ſcore to the hundred: in lathing, 500 are uſually allowed to a bundle of five feet laths, and 600 to a bundle of four feet laths: in flooring, 200 are ſufficient for a ſquare of flooring.

The duties on nails imported, are as follow: chair-nails, on importation, pay the thouſand 2 s. $6\frac{80}{100}$ d. and draw back, on exportation, 2 s. 3 d. more if braſs, $7\frac{1}{2}$ d. the whole of which is drawn back on exportation. Copper-nails the ten thouſand, pay, on importation, 2 s. $6\frac{80}{100}$ d. and draw back, on exportation, 2 s. 3 d. more for every 112 pounds, 16 s. $4\frac{87\frac{1}{2}}{100}$ d. the whole drawn back on being exported. Harneſs-nails, the ten thouſand, pay on importation, 3 s. $10\frac{20}{100}$ d. and draw back, on exportation, 3 s. $4\frac{1}{2}$ d. more if braſs, $11\frac{1}{4}$ d. and draw back, the whole on exportation. Head-nails, the barrel, pay, on exportation, 1 l. 10 s. $9\frac{60}{100}$ d. and draw back, on exportation, 1 l. 7 s. and ſmall nails in the ſame proportion for the half barrel. Roſe-nails, and ſadler's-nails, the ten thouſand pay, on importation, 2 s. $6\frac{80}{100}$ d. and draw back, on exportation, 2 s. 3 d. more if braſs, $7\frac{1}{2}$ d. and draw back, the whole. Sprig-nails, the ten thouſand, pay on importation, 1 s. $3\frac{40}{100}$ d. and draw back, on exportation, 1 s. $1\frac{1}{2}$ d. Beſides the above duties, thoſe made of iron pay for every 112 pounds weight, on importation, 4 s. $8\frac{1}{4}$ d. which is drawn back on exportation.

NAIL, is alſo a meaſure of length, containing the ſixteenth part of a yard.

NAIRN, a borough and port-town of Scotland, eighteen miles eaſt of the town of Inverneſs.

NAISSANT, in heraldry, is applied to any animal iſſuing out of the midſt of ſome ordinary, and ſhewing only his head, ſhoulders, fore feet and legs, with the tip of his tail, the reſt of his body being hid in the ſhield, or ſome charge upon it; in which it differs from iſſuant, which denotes a living creature ariſing cut of the bottom of any ordinary or charge.

NAKED, in architecture, is the ſurface or plain from whence the projectures ariſe,

ariſe, or which ſerves as a ground to the projectures. Thus, we ſay the foliages of a capital ought to anſwer to the naked of a column, and that a pilaſter ought to exceed the naked of the wall by ſo many inches.

NAKED FIRE, in chemiſtry, is an open fire; or one where a veſſel is immediately expoſed to the fire. See the articles FIRE and HEAT.

NAKED SEEDS, in botany, are thoſe that are not incloſed in any pod or caſe.

NAKIB, the deputy of the cadileſcher of Egypt. See CALILESCHER.

NAKOUS, a muſical inſtrument, conſiſting of two braſs-plates, which are ſuſpended by ſtrings, and ſtruck together ſo as to beat time: they are uſed in the coptic churches in Egypt, and in the mahometan proceſſions.

NAKSIVAN, a city of Perſia, in the province of Chirvan: eaſt long. 45°, north lat. 39° 15′.

NAMA, in botany, a genus of the pentandria digynia claſs of plants, the flower of which conſiſts of five petals; and the fruit is a capſule of an oval figure formed of two valves, and containing only one cell.

NAMATION, the ſame with naam. See the article NAAM.

In Scotland, this word in particularly uſed for impounding of cattle. See POUND.

NAME, *nomen*, denotes a word whereby men have agreed to expreſs ſome idea; or which ſerves to ſignify a thing or ſubject ſpoken of. This the grammarians uſually call a noun, though their noun is not of quite ſo great an extent as our name. See the article NOUN.

Names are either proper or appellative. Proper names are thoſe which repreſent ſome individual thing or perſon, ſo as to diſtinguiſh it from all other things of the ſame ſpecies, as Ariſtotle, which repreſents a certain philoſopher. Proper names are either called Chriſtian, as that given us at baptiſm, or ſurnames; the firſt impoſed for the diſtinction of perſons, anſwering to the roman prænomen; the ſecond for the diſtinction of families, anſwering to the nomen of the Romans, and the patronymicum of the Greeks. See the article PATRONYMIC, &c.

The Jews gave the name at the circumciſion, *viz.* eight days after the birth: the Romans to females the ſame day, and to males on the ninth, at which time they held a feaſt, called nominalia. Since chriſtianity has obtained, moſt nations have followed the Jews, baptizing and give the name on the eighth day after the birth, but our anceſtors till of late baptized and gave the name on the birth-day.

The firſt impoſition of names was founded on different views among different people; the moſt uſual was, to mark the good wiſhes of the parents, or to entitle the children to the good fortune a happy name ſeemed to promiſe, hence Victor, Caſtor, Fauſtus, &c. The antient Britons, Camden ſays, generally took their names from colours, becauſe they painted themſelves. When they were ſubdued by the Romans, they took roman names: the Saxons introduced the german names; the Danes brought with them their names; and the Normans their names. The various names antiently, or at preſent obtaining among us, from what language or people ſoever borrowed, are explained by Camden in his remains. In monaſteries, the religious aſſume new names at their admittance, to ſhew they are about to lead a new life, and have renounced the world, their family, and even their name, as brother Henry of the holy ſacrament, ſiſter Mary of the incarnation, &c. The popes alſo change their names at their exaltation to the pontificate; and it is frequent in Italy to join the name of ſome ſaint in a kind of devotion to the chriſtian name.

Appellative, or general names, are thoſe which ſignify common ideas, or which are common to ſeveral individuals of the ſame ſpecie, as a horſe, animal, &c. See the article GENERAL TERMS.

Specific NAME. See the article SPECIFIC.

NAMIUM, or NAAM, in law. See the article NAAM.

NAMUR, a ſtrong city of the Auſtrian Netherlands, capital of the province of Namur, ſituated at the confluence of the Sambre and Maeſe: eaſt long. 4° 50′, north lat. 50° 30′.

The county of Namur is bounded by Brabant on the north; by Liege and Luxemberg, on the eaſt; and by the province of Hainault on the ſouth and weſt.

NAMUR-MARBLE, a name given by our artificers to a ſpecies of black marble, which is very hard, and capable of a a good poliſh, but has no variegations of any other colour. It is common in Italy, France,

France, and Germany, and is the ſpecies called the lucullean marble by the Romans. See the article MARBLE.

NANCY, the capital of Lorrain in Germany, ſituated in eaſt long. 6°, north lat. 48° 44′.

NANFIO, one of the iſlands in the Archipelago, ſixteen miles round, and ſituated in eaſt long. 26°, north lat. 35°.

NANGASAQUI, a city on the weſt ſide of the iſland of Bungo, ſituated in eaſt long. 130°, north lat. 32° 30′.

NANKING, the capital of the province of Nanking, and formerly of the empire of China, is ſituated in eaſt long. 118° 30′, north lat. 32°.

NANSAMUND, a county of Virginia, in north America, ſouth of the Iſle of Wight-county, through which the river of Nanſamund runs.

NANTZ, a city of France, in the province of Brittany, ſituated on the river Loire, in weſt long. 1° 30′, north lat. 47° 15′.

NANTUCKET, an iſland on the coaſt of New-England in North-America, ſituated in weſt long. 70° north lat. 41°.

NANTWICH, a market-town of Cheſhire, ſituated ſeventeen miles ſouth-weſt of Cheſter.

NAPÆA, in botany, a genus of the monadelphia-polyandria claſs of plants, the calyx of which is a ſingle leafed round permanent perianthium, cut into five ſegments; the corolla conſiſts of five oblong, concave petals, connected by long ungues; the fruit conſiſts of a number of capſules, each containing a ſingle kidney-ſhaped ſeed.

NAPE, a name uſed for the hind part of the neck, ſuppoſed to be on account of the ſhort hair growing there, in reſemblance of the nap of a cloth.

NAPHTHA, in natural hiſtory, a fluid mineral body, of a thin conſiſtence, bright and pellucid, of a ſtrong ſmell, very readily inflammable, and when pure, burning away without leaving any reſiduum.

The naphtha is found in conſiderable quantities floating on the water of certain ſprings, principally breaking out at the ſides of hills in Perſia, Tartary, and ſome parts of the empire of China, where if a lighted candle be held near the ſurface, it takes fire and overſpreads the ſurface of the water for a great extent, with a ſtrong white flame, and emits a very diſagreeable ſmell. The genuine naphtha is very rare in Europe; it is not known to be any where naturally produced here, and what we ſee of it is generally ſophiſticated. Diſtilled by the retort, it yields an oil ſomewhat thinner than it was originally, and of a weaker ſmell. The ſubſtance remaining at the bottom of the retort, has much the reſemblance of amber; and Dr. Hill thinks it highly probable, that the origin of all the amber in the world is from the ſame ſort of principle; nay he tells us that he has ſucceeded ſo far in an attempt to make amber by this fluid and an acid drawn from the crude pyrites, that he has produced a friable ſomewhat pellucid matter, having all the properties of amber except its hardneſs and clearneſs, and yielding a true ſalt and oil of amber on diſtillation. See the article AMBER.

The medicinal virtues of the naphtha are the ſame with the common petroleum, but in a more remiſs degree. It is uſed externally on many occaſions in Perſia; and is taken inwardly, a few drops for a doſe, in colics. The principal uſe made of it, however, is burning in lamps, for which purpoſe it is very proper.

NAPIER's, or NEPER's BONES. See the article NEPER.

NAPLES, the capital of the kingdom of Naples; ſituated in eaſt long. 15°, north lat. 41°.

The kingdom of Naples is one of the Sicilies; it is the ſouth-eaſt part of Italy, and it is ſituated between 14 and 19° eaſt long. and between 38 and 43° north lat. being bounded by the gulph of Venice on the north-eaſt, by the Mediterranean ſea on the ſouth-eaſt, by Sicily and the Tuſcan-ſea on the ſouth-weſt, and by the pope's territories on the north-weſt; and divided from the iſlands of Sicily only by the narrow ſtreight or pharo of Meſſina.

NAPLES YELLOW, the common name in the colour ſhops of London, and among our painters, for the ochre called Giallolino. See the article GIALLOLINO.

NAPOLI DE MALVASIA, a port-town of the Morea, ſituated at the entrance of the gulph of Napoli de Romania, and forty miles ſouth-eaſt of that city.

NAPOLI DE ROMANIA, a city and port-town of European Turky, in the province of the Morea, ſituated at the bottom of a bay of the ſame name in the Archipelago, in eaſt long. 23° 20′, north lat. 37° 30′.

NARBARTH, a town of Pembrokeſhire, in ſouth-Wales, ſituated ten miles north-eaſt of Pembroke.

NARBONE,

NARBONE, a city of France, in the province of Languedoc: ſituated in eaſt long. 2° 40′, north lat. 43° 18′.

NARBOROUGH, an iſland of South-America, in the Pacific-Ocean, ſituated on the coaſt of Chili, in weſt long. 85°, ſouth lat. 45°.

NARCISSUS, the DAFFODIL, in botany, a genus of the hexandria monogynia claſs of plants, the corolla whereof conſiſts of a nectarium formed of one leaf of a cylindric or funnel ſhape, coloured at the top and wide, curled and plicated at the mouth, and of ſix oval acuminated plane petals affixed externally to the tube of the nectarium above its baſe: the fruit is a roundiſh obtuſely trigonal capſule, formed of three valves, and containing three cells, in which are a number of round appendiculated ſeeds, with a columnar receptacle.

The root of this plant is emetic, vulnerary and detergent.

NARCOTICS, in medicine, ſoporiferous medicines, which excite a ſtupefaction. See the article OPIATES.

Narcotics, called alſo hypnotics, anodynes, or ſtupefactives, are ſaid, by Hoffman, to be ſuch kind of remedies as, by their ſubtile, noxious, and deleterious exhalations, diminiſh, or quite deſtroy the ſenſe and motion of the ſolid parts. Among narcotics, the moſt eminent are thoſe which are uſually prepared for medicinal uſes of the whole poppy, eſpecially opium; as alſo all thoſe prepared of mandragoras, hyoſcyamus, ſtramonium, and datura. Theſe, ſays the abovementioned author, are not without reaſon reckoned poiſons, ſince they exert their noxious influence in a ſhort ſpace of time, when taken in a ſmall quantity; and a quantity a little larger than ordinary proves mortal. Beſides, their principal operation is on the moſt noble parts of the body, which are the organs of ſenſe and motion; and moreover, they act by means of an element quite oppoſite to nature, a noiſome ſulphureous vapour, by which they diminiſh to a conſiderable degree, or quite deſtroy the ſenſe and motion of the motive fibres. The elements by which narcotics act, are of an highly volatile and penetrating nature, ſince they deeply inſinuate themſelves like a vapour into the pores of the membranes and nerves, and by contaminating that moſt pure and moveable fluid, deprive, by little and little, the ſolids of their tone and motion.

Narcotics act on the nervous membranes of the ſtomach and inteſtines, principally by means of a vaporous and fetid ſulphur; for as the ſtomach and inteſtines firſt and immediately feel the force and efficacy of remedies, they are ſo much the more liable to ſuffer from the influence of medicines which are of a ſtronger and more penetrating nature than ordinary. Theſe medicines have alſo a mighty influence on the membranes of the brain, where, by greatly diminiſhing the ſpring and ſyſtole of the arteries, they cauſe ſtagnation of their blood therein, with diſtenſions of the veſſels of the head, by which means they induce a torpor, drowſineſs, deliriouſneſs, with frightful and troubleſome dreams. Theſe medicines were therefore ſuſpected, by the wiſeſt phyſicians among the antients, in the cure of diſeaſes, on account of their deleterious quality.

NARDO, a port-town of Italy, in the kingdom of Naples: eaſt longitude 19°, north latitude 40° 33′.

NARDUS, SPIKENARD, in botany, a genus of the triandria-digynia claſs of plants, the corolla whereof is formed of two valves; the exterior is long and of a lanceolato-linear figure; it terminates in an ariſta or awn, and contains within it the other, which is ſmaller, and terminates in a ſhorter awn: the ſeed is ſingle, of a linear oblong figure, narrower at top than at bottom, and pointed at each end; the corolla ſurrounds it by way of a pericarpium.

This plant is cephalic and ſtomachic; it is recommended in nephritic caſes, and as a promoter of the menſes. It is alſo given in chronic caſes to remove obſtructions of the viſcera: however, the modern practice does not uſe it much, except as an ingredient in ſome of the officinal compoſitions. It has a very fragrant aromatic ſmell and taſte.

NARRATION, in oratory and hiſtory, a recital or rehearſal of a fact as it happened, or when it is ſuppoſed to have happened.

Narration is of two kinds, either ſimple or hiſtorical, as where the auditor or reader is ſuppoſed to hear or read of a tranſaction at ſecond hand; or artificial and fabulous, as where their imaginations are raiſed, and the action is as it were re-acted before them. The narration, according to the writers of rhetoric, makes the ſecond part of a juſt ſpeech or harangue, *viz.* that immediately

stely following to the exordium. It makes the whole history, abating for the occasional reflections, episodes and digressions. Cicero requires four virtues in a narration, *viz.* perspicuity, probability, brevity, and sweetness. The narration is rendered perspicuous by observing the order of time, by using none but proper and known terms, and by reciting the action uninterruptedly. It is rendered probable by the credibility of the narrator, by the simplicity and openness of the narration, by avoiding every thing far remote from the common sense and opinion of mankind, and by a precise detail of circumstances. It is rendered brief by taking it up no higher than is necessary, nor fetching it back; and by avoiding trivial circumstances. Lastly, it is rendered sweet by using smooth, numerous, and well-sounding words; by arranging them so as to avoid any hiatus or clashing; by the greatness, the novelty, and unexpectedness of the things related; and by enriching it with tropes and figures. See HISTORY, ORATORY, TROPE, *&c.*

NARRATION, in poetry, is used for the action, or event, that make the subject of an epic poem.

For the virtues of the poetic narration, see the article EPIC.

NARWAL, in ichthyology, the unicorn-fish, so called from a long wreathed tooth, ten or more feet in length, which has more the appearance of a horn than of a tooth; though it be really a tooth fixed in the gomphosis of the upper jaw, altogether in the manner of other teeth: hence some have called it monodon, which is certainly a more proper name than that of the unicorn-fish.

The narwal is a fish of the whale-kind, often growing to twenty five feet in length, but is more commonly found from sixteen to twenty.

NARVAR, a city of the hither India, the capital of the province of Narvar: east long. 79°, north lat. 25°.

NASALIA, in medicine, a sort of remedies to be taken by the nose, called also errhines. See the article ERRHINES.

NASIAS, in anatomy, a thin bone making the upper part of the nose. See the article NOSE.

NASSAU, the capital of the county of the same name in Germany: east long. 7° 25′, north lat. 50° 21′.

NASUS, in ichthyology, the cyprinus with a nasiform snout, and fourteen rays in the pinna ani. See CYPRINUS.

NATA, a port-town of Darien, situated on the bay of Panama.

NATAL TERRA, a country on the south-east coast of Africa, between 23° and 30° of south latitude, and between 25° and 35° of east longitude.

NATALIS, or NATALIS DIES, properly signifies a man's birth-day; but was used by the heathens to signify the feast held on the anniversary of the birth-day of an emperor, whence it came in time to signify any sort of feast; and the primitive christians used it in this sense.

Ludi NATALITII, NATAL-GAMES, those introduced on the anniversaries of the birth-days of great men.

NATES, in anatomy, a term expressing those two fleshy exterior parts of the body, vulgarly called the buttocks.

NATES CEREBRI, two circular protuberances of the brain, situated on the back-side of the medulla oblongata, near the cerebellum. See BRAIN and MEDULLA.

NATION, a collective term, used for a considerable people inhabiting a certain extent of land, confined within fixed limits, and under the same government.

In some universities the word nation is used for a distinction of the scholars, the professors and colleges: thus the faculty of arts in the university of Paris, consists of four nations; *viz.* that of France, that of Normandy, that of Picardy, and that of Germany; which last comprehends all foreign nations, as the English, Italians, *&c.*

NATIVE, a person considered as born in a certain place which was the proper residence of his parents, and where he received his education.

NATIVE, or NATIVUS, in our antient law-books, signifies a person born in a state of villainage, in contradistinction to a bonds-man, or one who became a villain by his own act and deed.

NATIVITY, or NATAL-DAY, the day of a person's birth. The word nativity is chiefly used in speaking of the saints, as the nativity of St. John the Baptist, *&c.* But when we say the Nativity, it is understood of that of Jesus Christ, or the feast of Christmas. See the article CHRISTMAS.

NATIVITY, in old law-books, signifies villainage or servitude.

NATIVITY, in astrology, the situation of the heavens, and particularly of the twelve houses at the moment of a person's birth. See the article HOROSCOPE.

NATIVO HABENDO, a writ which antiently

tiently lay for apprehending a villain and reſtoring him to his lord.

NATOLIA, the modern name of the leſſer Aſia; being the moſt weſterly part of Turky in Aſia, and conſiſting of a large peninſula, which extends from the river Euphrates, as far as the Archipelago, the ſea of Marmora, the ſtraits of Galipoli and of Conſtantinople, which ſeparate it from Europe on the weſt. It is bounded on the north by the Black-ſea, and on the ſouth by the Mediterranean ſea.

NATRIX, in zoology, a ſpecies of ſerpent with one hundred ſeventy-ſix ſcuta upon the abdomen, and ſixty ſquamæ on the tail. See the article SERPENT.

NATRUM, the nitre of the antients, in natural hiſtory, is a genuine, pure and native ſalt, extremely different from our nitre, and indeed from all the other native ſalts; it being a fixed alkali, plainly of the nature of thoſe made by fire from vegetables, yet capable of a regular cryſtallization, which thoſe ſalts are not. It is found on the ſurface of the earth, or at very ſmall depths within it, and is naturally formed into thin and flat cakes or cruſts, which are of a ſpungy or cavernous ſubſtance, very light and friable, and when pure, of a pale browniſh-white; but as its ſpungy texture renders it very ſubject to be fouled by earth received into its pores, it is often met with of a deep dirty-brown, and not unfrequently reddiſh.

Natrum, whether native or purified, diſſolves in a very ſmall quantity of water; and this ſolution is, in many parts of Aſia, uſed for waſhing; where it is alſo made into ſoap by mixing it with oil. Natrum reduced to powder, and mixed with ſand or flints, or with any other ſtone of which cryſtal is the baſis, makes them readily run into glaſs. Gold heated red-hot, and ſprinkled with a ſmall quantity of this ſalt, melts immediately; ſilver ignited and ſprinkled with it, melts in the ſame manner; as does alſo iron, copper, and the regulus of antimony, which melt much more eaſily than they otherwiſe would do. Mercury will not be mixed with it by any art, and indeed will not amalgamate with metals if only a little of this ſalt be added. It is found in great abundance in many parts of Aſia, where the natives ſweep it up from the ſurface of the ground and call it ſoap-earth. The earlieſt account we have of it is in the Scriptures, where we find that the ſalt called nitre in thoſe times would ferment with vinegar, and had an abſterſive quality, ſo that it was uſed in baths and in waſhing things. Solomon compares the ſinging of ſongs with a heavy heart, to the contrariety of vinegar and nitre; and Jeremiah ſays, that if the ſinner waſh himſelf with nitre his ſin is not cleanſed off. Theſe are properties that perfectly agree with this ſalt, but not at all with our ſalt-petre.

NATTA, in ſurgery, a tumour of the oedematous kind. See OEDEMA.

NATURAL, in general, ſomething that relates to nature. See NATURE.

Natural-children are thoſe born out of lawful wedlock.

The natural-functions, are thoſe actions whereby the aliments are changed and aſſimilated ſo as to become a part of the body. See the articles FUNCTION, DIGESTION, CHYLIFICATION, &c.

NATURAL HISTORY, a deſcription of the productions of the earth, air, water, &c. See the articles EARTH, &c.

The natural-hiſtory of any one place is a very extenſive ſubject, which, according to Mr. Boyle, may be conveniently reduced to four heads, *viz.* the things that regard the heavens, the air, the waters, and the earth.

Of the firſt claſs, are the longitudes and latitudes of places, the lengths of the longeſt and ſhorteſt days and nights; the climates, parallels, &c. what fixed ſtars are ſeen, and what are not ſeen there.

About the air may be obſerved, its temperature, as to the firſt four qualities, and the meaſure of them; its weight, clearneſs, and refractive power; its ſubtilty or coarſeneſs; its abounding with or wanting an eſurine ſalt; its variations according to the ſeaſons of the year, and the times of the day; what duration the ſeveral kinds of weather uſually have; what meteors it is moſt or leaſt apt to breed; and in what order they are generated, and how long they generally laſt; what winds it is moſt ſubject to; whether any of them be ſtated or ordinary; what diſeaſes are ſaid to be epidemical, or depending on the ſtate and condition of the air; what other diſeaſes it is ſubject to, wherein the air may be ſuppoſed to have ſome ſhare; what is the uſual ſalubrity of it, and what ſort of conſtitutions it agrees with, what does not. See the article AIR.

About the waters, it may be proper to obſerve the ſea, its depth, tides, cur-

rents, ſaltneſs, and other qualities; next the rivers will come under conſideration, their depth, length, courſe, inundation, and the goodneſs or badneſs of their waters, with their gravity, and other peculiar qualities; after theſe, the lakes, ſprings, ponds, &c. are to be conſidered, eſpecially the mineral waters, their kinds, qualities and virtues, and the manner of trying them: the inhabitants of the waters may follow here; and the particular kinds of fiſh that are found there, whether of the ſea or rivers, are to be mentioned, with an account of their ſtores, bigneſs, goodneſs, ſeaſons of perfection, haunts, peculiarities of any kind relating to them, and the manner of taking them, eſpecially when there is any thing ſingular in it.

The things relating to the earth, are laſt to be examined: theſe are, firſt the earth itſelf, then its inhabitants, and its various productions, whether external or internal. In the earth itſelf may be obſerved, its dimenſions, ſituation eaſt, weſt, north and ſouth; its figure; its plains and valleys, and their extent; its hills and mountains, and the height of the talleſt, both in reference to the neighbouring valleys and plains, and to the level of the ſea; as alſo whether the mountains lie ſcattered, or are diſpoſed in ridges; and if of the latter kind, whether they run eaſt, weſt, north or ſouth. What promontories alſo, and what fiery or ſmoaking hills it has, if any: whether the country be coherent, or much broken into iſlands: what the magnetical declination is in ſeveral places, and the variation of that declination in the ſame place, and if thoſe be conſiderable; what may be conjectured as the occaſions of them, whether the vicinity of iron-mines, of ſubterraneous fires, or what elſe. What the nature of the ſoil is, whether clayey, ſandy, or of good mould; and what vegetables, plants and trees beſt agree with it and ſucceed in it, what worſt. By what particular contrivances the inhabitants improve the advantages, or remedy the diſadvantages of the ſoil; and what hidden qualities the ſoil may have. The inhabitants of the earth are then to be conſidered, both natives, and ſtrangers that have been long ſettled there; and in particular, their ſtature, colour, features, ſtrength, agility, or defects of theſe; and their complexions, hair, beauty, and the like; their diet, inclinations and cuſtoms, ſo far as they are not owing to education; the fruitfulneſs or barrenneſs of the women; their hard or eaſy labours; the diſeaſes they are moſt ſubject to, and any remarkable ſymptoms attending them.

As to the external productions of the earth, the enquiries are to be theſe: what graſſes, grains and fruit it beſt produces: the herbs, flowers, and timber-trees; and the coppices, groves, foreſts and woods the country has or wants: what peculiarities are obſervable in any of them; what ſoils they moſt like or diſlike, and with what culture they thrive beſt. Then what animals the country has or wants, both as to wild beaſts and birds of prey, and as to poultry and cattle of all ſorts; and particularly, if they have any animals that are not common, or any thing particular in thoſe they have. After thoſe, the ſubterraneous ſtores are to be examined; what minerals the earth affords, and what it wants: then what quarries of ſtone, and in what manner they lie: what clays and earths are found there; as, clays, marles, fuller's earths, earths for tobacco-pipes, earth for potter's wares, medicinal earths: what other mineral productions it yields, whether coals, ſalt-mines, or ſalt-ſprings, alum, vitriol, ſulphur, &c. What metals the country yields, with a deſcription of the mines of them; their depths, numbers, ſituations, ſigns, waters, damps, quantities of ores, goodneſs of the ores, and the ways in uſe for the reducing them to metals.

To theſe general heads ſhould be added, inquiries into traditions in the country, of any thing relating to it, whether peculiar to it, or only more common there than elſewhere; and where theſe require learning or ſkill in the anſwer, the utmoſt care is to be taken to put the people in a way to give their accounts in a ſatisfactory manner; for a falſe or bad account of any thing, is always much worſe than no account at all.

NATURAL INCLINATIONS, are the tendencies of our minds towards things ſeemingly good. See the articles GOOD and PASSIONS.

NATURAL PHILOSOPHY, that which conſiders the powers and properties of natural bodies, and their mutual actions on one another.

The buſineſs of natural philoſophers, ſays Boerhaave, is to communicate a ſolid and accurate knowledge of all the bodies in being, and all the affections thereof.

Nor

Nor can this ſcience be acquired otherwiſe than by obſerving, by means of our ſenſes, all the objects which the author of nature has made cognizable thereto: hence, the firſt and principal part of this ſcience is to collect all the manifeſt and ſenſible appearances of things, and reduce them into a body of natural hiſtory. Now there are two ways of making ſuch obſervations; the firſt when we view things nearly as they happen to turn up, without any deſign or intervention of our own; in which way no great improvements can be expected in the art, becauſe chance having here the direction, only exhibits occaſional or extemporary properties: the other method is, when, after a thorough acquaintance with bodies, we apply them to other bodies equally known, diligently attending to the reſult, and obſerving whether any thing new ariſes. See the article EXPERIMENTAL PHILOSOPHY.

NATURAL, in muſic, is a term variouſly uſed: thus natural muſic is the ſame with vocal, in oppoſition to artificial muſic, or that performed on inſtruments. A ſong is alſo called natural, when its notes move eaſily and gracefully, the voice or inſtrument being nowiſe forced or ſtrained. Natural harmony is that produced by the natural and eſſential chord of the mode. See the articles MODE and HARMONY.

A natural note is uſed to contradict thoſe flats and ſharps that are uſed at the beginning of a ſtave; and in ſuch caſe, it muſt be taken exactly as in the gamut. For the character of this note, ſee the article CHARACTER.

NATURAL, in heraldry, is when animals, fruits, flowers, *&c.* are blazoned with their natural colours.

NATURALIST, a perſon well verſed in the ſtudy of nature, and the knowledge of natural bodies, eſpecially in what relates to animals, vegetables, metals, minerals, and ſtones. See the article NATURAL PHILOSOPHY.

NATURALIZATION, in law, the act of naturalizing an alien, or placing him in the condition of a natural born ſubject. In England, this is done by act of parliament; but none can be naturalized before they have received the ſacrament of the church, and taken the oaths of allegiance and ſupremacy. A perſon who is naturalized may have lands by deſcent, as heirs at law, as well as obtain them by purchaſe: but they are diſabled from being of the king's privy council, or of holding offices, 7 Jac. I. 12 W. III. c. 2. By a late ſtatute it is ordained, that all children born out of the king's dominions, whoſe fathers were or are natural ſubjects to this kingdom at the time of their birth, ſhall be adjudged natural-born ſubjects of this realm, except children of parents who are attainted of treaſon, or that are in the actual ſervice of a foreign prince at enmity with us. 4 Geo. II. c. 2. By an act of 13 Geo. II. all Jews who have reſided in the britiſh colonies in America, without being abſent two months at any one time, are declared naturalized without their receiving the ſacrament of the Lord's ſupper.

NATURALS, *res naturales*, among phyſicians, whatever naturally belongs to an animal, in oppoſition to non-naturals. See the artiticle NON-NATURALS.

NATURE, *natura*, according to Mr. Boyle, has eight different ſignifications; it being uſed, 1. For the author of nature, whom the ſchoolmen call *natura naturans*, being the ſame with God. 2. By the nature of a thing, we ſometimes mean its eſſence; that is, the attributes which make it what it is, whether the thing be corporeal or not; as when we attempt to define the nature of a fluid, of a triangle, *&c.* 3. Sometimes we confound that which a man has by nature, with what accrues to him by birth; as when we ſay, that ſuch a man is noble by nature. 4. Sometimes we take nature for an internal principle of motion; as when we ſay, that a ſtone by nature falls to the earth. 5. Sometimes we underſtand, by nature, the eſtabliſhed courſe of things. 6. Sometimes we take nature for an aggregate of powers belonging to a body, eſpecially a living one; in which ſenſe phyſicians ſay, that nature is ſtrong, weak, or ſpent; or that, in ſuch and ſuch diſeaſes, nature left to herſelf will perform the cure. 7. Sometimes we uſe the term nature for the univerſe, or whole ſyſtem of the corporeal works of God; as when it is ſaid of a phœnix, or chimera, that there is no ſuch thing in nature. 8. Sometimes too, and that moſt commonly, we expreſs by the word nature a kind of ſemi-deity, or other ſtrange kind of being.

If, ſays the ſame philoſopher, I were to propoſe a notion of nature, leſs ambiguous than thoſe already mentioned, and with regard to which many axioms, re-

lating to that word, may be conveniently underſtood, I ſhould firſt diſtinguiſh between the univerſal and the particular nature of things. Univerſal nature I would define to be the aggregate of the bodies that make up the world, in its preſent ſtate, conſidered as a principle; by virtue whereof they act and ſuffer, according to the laws of motion, preſcribed by the author of all things. See the articles BODY, INERTIA, MOTION, &c. And this makes way for the other ſubordinate notion; ſince the particular nature of an individual conſiſts in the general nature, applied to a diſtinct portion of the univerſe; or, which is the ſame thing, it is a particular aſſemblage of the mechanical properties of matter, as figure, motion, &c.

Thoſe who deſire a more particular diſcuſſion of each of theſe opinions, may conſult Boyle's Free Inquiry into the vulgar notion of nature.

NAVAL AFFAIRS, comprehend whatever relates to navigation, ſhip-building, ſailors, &c. See the articles NAVIGATION, and *Conſtruction* of SHIPS.

The hiſtory of the naval affairs of any one ſtate is a very comprehenſive ſubject, much more that of all nations. Thoſe who would be informed of the maritime affairs of England, and the figure it has made at ſea in all ages, may find abundance of curious matter in Selden's Mare Clauſum; and from his time to ours, we may trace a ſeries of facts in Lediard's and Burchet's Naval Hiſtory.

Not only the preſervation of that ſhare of commerce we at preſent poſſeſs, but its future advancement, and even the very being of Great Britain, as an independent empire, and a free people, depend no leſs on the good condition and the wiſe regulation of our naval affairs, than on the ſuperiority of its maritime power: and that the legiſlature has been ever attentive to this great and important object, will appear from the following account of the laws that have been enacted relating to the naval affairs of Great Britain.

So early as 5 Rich. II. c. 3. it was enacted, that none of the king's ſubjects ſhould bring in or carry out any merchandize, but in engliſh ſhips, on pain of forfeiting all the merchandize otherwiſe conveyed, or the value thereof: but 6 Rich. II. ordains, that the above ſtatute ſhall only take place where able ſhips belonging to the king's ſubjects are to be found; for where they are not to be had, the merchants are allowed to hire other ſhips. By 4 Hen. VII. c. 10. it was enacted, that no Gaſcoign or Guienne-wines, &c. ſhould be imported into this realm but in engliſh veſſels: and that none ſhould freight any merchandize in any ſtranger's ſhip, if he could have ſufficient freight in a denizen's ſhip, under the penalty of forfeiting all merchandize not thus ſhipped, to be divided between the king and the ſeizer: but this act, ſo far as it related to the above wines, was repealed by the ſtatute 32 Hen. VIII. c. 14. and a rate was ordered of what ſhould be paid for the freight of the ſeveral ſorts of merchandize in ſhips, from the port of London to other places, and from thence to London. By 1 Eliz. c. 13. it was enacted, that if the owner of any merchandize ſhould, in the time of peace, embark or unload any part thereof, (maſts, pitch, tar and corn only excepted) out of, or into any foreign ſhip, he ſhould pay cuſtom as an alien.

By the act of navigation, 12 Car. II. c. 18. it is enacted, that no goods ſhall be imported into, or exported out of, any territories belonging to, or that may hereafter belong to his majeſty, his heirs and ſucceſſors, in Aſia, Africa, or America, in any other ſhips beſides ſuch as belong to the people of England, Ireland, Wales, or the town of Berwick upon Tweed, and whereof the maſter and three fourths of the mariners are Engliſh, on pain of forfeiting both the ſhip and lading, one third part to the king, another to the governor of the country where ſuch default ſhall be, if ſeized there, otherwiſe that third alſo to the king, and the other third to him that will ſeize or ſue for the ſame. And commanders at ſea, having the king's commiſſion, are to bring in as prize all ſuch ſhips, and on their being condemned, one moiety is to be for the uſe of ſuch commanders and their companies, and the other moiety to the king. No goods of the growth or manufacture of Muſcovy, or of the produce of the turkiſh empire, ſhall be imported into England, Ireland, &c. in any ſhip or veſſel not engliſh built, or not belonging to the people of England, Ireland, &c. and navigated as aforeſaid; except veſſels built at the place from whence the goods came, or of ſuch port where they can only be, and uſually are ſhipped, on pain of forfeiting the ſhip and

and goods: and all wines of the growth of France and Germany, and divers goods and merchandize from Spain, Portugal, Ruſſia, &c. which ſhall be imported into the places aforeſaid, in any other ſhip than what doth belong to England, Ireland, &c. and are navigated as aforeſaid, ſhall be deemed alien's goods, and pay accordingly. And no foreign-built veſſel ſhall paſs as a ſhip belonging to England, Ireland, Wales, &c. till the owner makes it appear to the chief officer of the cuſtoms, in the port next to the place of his abode, that he is not an alien, and take an oath that it was *bona fide* bought of ſuch perſons, expreſſing the ſum given, and the time and place when and where, &c. and that no foreigner has a ſhare in it. Alſo none ſhall load in any bottom, if ſtrangers are owners, part-owners, or maſter, and of which three fourths of the mariners at leaſt are not Engliſh, any goods whatſoever from one port or creek of England, Ireland, Wales, Guernſey, Jerſey, or the town of Berwick, to another port of the ſame, on pain of forfeiting ſuch goods and veſſel.

The 22 and 23 Car. II. c. 11. ordains, that where any goods ſhall be laden on board any engliſh ſhip of the burden of two hundred tons, or upwards, and mounted with ſixteen guns, or more, if the maſter yields up ſuch ſhip or goods to any turkiſh veſſel, or any pirate, without fighting, upon proof thereof in the admiralty, he ſhall be incapable of taking charge of any engliſh veſſel: and maſters of engliſh ſhips, though not of that burden, nor mounted as aforeſaid, that ſhall yield without fighting to a turkiſh ſhip or pirate, that has not at leaſt double the number of guns, ſhall be liable to the penalties of this act. If any inferior officers or mariners of a ſhip, ſhall refuſe to fight when commanded, or utter words to diſcourage others, they ſhall loſe all their wages due, and be impriſoned not exceeding ſix months; and mariners laying violent hands on their commanders, to hinder them from fighting in defence of their ſhips, ſhall ſuffer death as felons. When any engliſh ſhip ſhall have been defended by fight, and brought to her port, in which fighting any of her men have been wounded or ſlain, the judge of the admiralty, or his ſurrogate, &c. where ſhe ſhall arrive, upon the petition of the maſter and ſeamen, may call ſo many as he ſhall be informed are the adventurers and owners, and by adviſing with them, levy upon the reſpective owners ſuch ſums as he himſelf, and the major part of them preſent, ſhall judge reaſonable, not exceeding two *per cent.* of the ſhip and goods: which money ſhall be diſtributed among the maſter, officers and ſeamen, or the widows and children of the ſlain, according to the direction of the judge, with the approbation of three or more of the adventurers.

By the 5th and 6th of Will. and Mary, c. 24. every perſon who ſhall build, or cauſe to be built, any ſhip of three decks, containing 450 tons, and mounted with thirty-two pieces of ordnance, having ammunition, &c. proportionable, ſhall for the firſt three voyages which the ſaid ſhip ſhall make to any foreign parts, receive a tenth of the cuſtoms called the ſubſidy of tonnage and poundage, payable for merchandize exported and imported in ſuch ſhips: but if after the end of the three firſt voyages, ſhips ſo built, ſhall be altered ſo as to become leſs defenſible than they were at firſt, then they ſhall be forfeited and loſt.

By 2 Ann. c. 9. owners of ſhips might navigate during the war with France, with maſters and only one half of the mariners engliſh: and by 3 and 4 Ann. c. 13. any ſhips might be navigated by foreign ſeamen; and foreigners ſerving on board any engliſh ſhip for two years, were to be deemed natural-born ſubjects, &c.

By 4 Geo. I. c. 12. and 11 Geo. I. c. 29. if any officer or mariner belonging to any ſhip or veſſel, ſhall wilfully caſt away, burn or deſtroy the ſhip to which he belongeth, or in any-wiſe direct or procure the ſame to be done, with intent to prejudice a perſon that ſhall have granted any inſurance thereon, or any merchant who ſhall load goods therein, or any owner of ſuch veſſel, the perſons offending ſhall on conviction be adjudged guilty of felony without benefit of clergy.

The 5th of Geo. II. c. 20. enacts, that no commander of any ſhip outward-bound ſhall receive on board any gunpowder, either as merchandize or ſtores for the voyage, except for his majeſty's ſervice, before ſuch ſhip ſhall be at Blackwall, in the river Thames; and all maſters of ſhips coming into the river, ſhall put on ſhore all powder either before the arrival of their ſhips at the ſaid

place,

place, or within twenty-four hours after they come to anchor there, upon pain of forfeiting 5 l. for every 50 pounds weight of gunpowder on board, and in the like proportion for a leſs quantity. And no guns ſhall be kept loaded with ſhot in merchant-ſhips between London bridge and Blackwall, or fired before the riſing, or after the ſetting of the ſun, under the penalty of 5 l. and for every gun ſo fired, 10 s. And if any pitch, tar, roſin, or other combuſtible matter ſhall be heated or melted by fire in any ſhips, every perſon ſo offending, ſhall, for every offence, forfeit 5 l. And ſhips are liable to be ſearched by an elder brother, appointed by the maſter, wardens, and aſſiſtants of the Trinity-houſe at Deptford. In caſe any ſhip ſhall be moored in the mouth or any other part of St. Saviour's dock, except ſuch ſhips as ſhall be loading or delivering their cargoes, and others, not exceeding two at a time, that ſhall lie at ſhipwright-yard, at the north-weſt corner of the ſaid dock, during the time they ſhall be repairing, the maſter of ſuch ſhip ſhall forfeit 20 s. for every day ſhe ſhall continue to be laid up and moored.

By 6 Geo. II. c. 29. maſters of ſhips lying in the river Thames who have occaſion for ballaſt, ſhall pay 1 s. per ton colliers, other ſhips 1 s. 3 d. and foreign ſhips 1 s. 7 d. per ton, to the corporation of the Trinity-houſe at Deptford; who ſhall pay ballaſt-men 9 d. a ton, for raiſing and carrying it, *&c.* and it ſhall be lawful for any maſter of a ſhip to appoint two perſons to go on board any lighter bringing ballaſt to ſuch ſhip, to inſpect the marks thereof; and every ballaſt-man ſhall immediately before the delivery of ballaſt to any ſhip, trim ſuch lighter, ſo as to make it ſwim at equal marks at the ſtem and ſtern, and pump all the water out, *&c.* and the maſter, wardens, and aſſiſtants of the Trinity-houſe, are to make good to the maſter, the quantity or value of the ballaſt which ſhall be found deficient, or forfeit 50 l. one moiety to the poor, and the other to the perſon ſuing for it. The 7th of Geo. II. c. 15. ordains, that no owners of ſhips ſhall be liable to any loſs by reaſon of embezzlement by the maſter or mariners, of any goods or merchandize ſhipped on board, or for any act done by them, without the privity or knowledge of ſuch owners, further than the value of the ſhip, and amount of the freight during the voyage, in which ſuch embezzlement of the maſter or mariners ſhall be committed: and if ſeveral perſons ſhall ſuffer damage by the means aforeſaid, and the value of the ſhip and cargo ſhould not be ſufficient to make compenſation; then the freighters ſhall receive ſatisfaction in average, in proportion to their reſpective loſſes, to be aſcertained on a bill in equity, exhibited for a diſcovery thereof, and of the value of ſuch ſhip and freight. But nothing in this act ſhall diſcharge any remedy, which any perſon may have againſt the maſter and mariners, in reſpect of an imbezzlement. See the articles FREIGHT, INSURANCE, *&c.*

NAVAL STORES comprehend all thoſe particulars made uſe of, not only in the royal navy, but in every other kind of navigation; as timber and iron for ſhiping, pitch, tar, hemp, cordage, ſail-cloth, gun powder, ordnance, and fire-arms of every ſort, ſhip-chandlery wares, *&c.* In order to encourage the importation of naval ſtores from Scotland and our own plantations, the following premiums have been granted for a certain time, and continued by ſeveral acts, from the third and fourth years of the reign of queen Anne, to the twenty-fourth of his late majeſty's reign, *viz.*

	l.	s.	d.
Hemp, water-rotted, bright and clean, from Scotland, or the britiſh plantations in America, the ton - -	6	0	0
Trees of twelve inches in diameter and upwards, fit for maſts, yards, or bow-ſprits, regularly converted, and turned at leaſt into eight ſquares, ſound and freſh, the ton, allowing 40 feet to each ton, girt-meaſure - -	1	0	0
The following from the britiſh plantations in America.			
Maſts, yards, and bow-ſprits, the ton, allowing 40 feet to the ton, - -	1	0	0
Clean merchantable tar, fit for making cordage, the ton,	2	4	0
Clean merchantable tar, prepared from green trees, by ſtripping off the bark, without cutting them down, fit for making cordage, per ton,	4	0	0
Clean and good pitch, per ton,	1	0	0
Clean and good turpentine, per ton, - -	1	10	0

The laſt act which grants theſe bounties, was to continue in force till the year 1757.

Upon

Upon the landing of theſe ſtores, the refuſal muſt be offered to the commiſſioners of the navy; and if, within twenty days after ſuch tender, they ſhall not contract for them, the importers may otherwiſe diſpoſe of them. No fee, gratuity, or reward, may be demanded or taken by the officers of the cuſtoms, for examining, viewing, or delivering any of the aforeſaid naval ſtores; or for making or ſigning certificates, in order to receive the premium, upon forfeiture of office and 100 l. and being rendered incapable of ſerving his majeſty. And if any of theſe naval ſtores, except hemp, ſhall be again exported, the exporter muſt, before entry thereof, produce to the collector, &c. of the cuſtoms, at the port of exportation, a receipt from the treaſurer of the navy, or his caſhier, ſubſcribed by his comptroller, or his chief clerk, ſignifying that the full amount of the premium had been repaid to him: on failure whereof, ſuch ſtores may not be exported; and if ſuch ſtores are fraudulently exported without repayment of the premium, they are forfeited, with double the value.

NAVAL CROWN, *corona navalis*, in roman antiquity. See the article CROWN.

NAVARINO, a port-town of european Turkey, in the Morea, ninety miles ſouth-weſt of Corinth.

NAVARRE, a province of Spain, bounded by french Navarre on the north-eaſt, by Arragon on the ſouth-eaſt, by old Caſtile on the ſouth-weſt, and by Guipuſcoa on the weſt. It is a mountainous country.

French Navarre, ſeparated from ſpaniſh Navarre on the ſouth-weſt by the Pyrenees, is only thirty miles long and fifteen broad; being one of the moſt barren provinces in France.

NAVE, in architecture, the body of a church, where the people are diſpoſed, reaching from the balluſter, or rail of the choir, to the chief door.

Some derive the word nave from ναὸς, a temple; and others, from *navis*, a ſhip, by reaſon the vault or roof of a church bears ſome reſemblance to a ſhip.

NAVEL, *umbilicus*, in anatomy, the center of the lower part of the abdomen; being that part where the umbilical veſſels paſſed out of the fœtus to the placenta of the mother. See the articles ABDOMEN, FOETUS, &c.

The navel-ſtring, or funiculus umbilicalis, of the fœtus, beſides its vein and two arteries, is compoſed of a ſpongy ſubſtance in which theſe veſſels are lodged, which upon entering the placenta, are divided into numerous branches, and leſſer ramifications.

As ſoon as the infant and after-burden are delivered, a firm ligature is made upon the navel-ſtring, with a ſtrong thread folded ſeveral times together, and about two or three fingers-breadth from the abdomen: this done, the navel-ſtring leading to the placenta is to be cut off, and the wound dreſſed with lint, till the part on which the ligature was made, becoming dry, falls off of itſelf.

NAVEL-WORT, *cotyledon*, in botany. See the article COTYLEDON.

NAVEREINI, a town of Gaſcony, in France, ſixteen miles ſouth-eaſt of Bayonne.

NAVEW, in botany. See the article RAPE SEED.

NAVICULARE OS, in anatomy, a bone of the foot, lying between the aſtragalus and oſſa cuneiformia, and ſo called from its reſemblance to a boat. See the articles FOOT, ASTRAGALUS, &c.

It has a glenoid cavity, for its articulation with the head of the aſtragalus; and its anterior faces are received into the ſinuſes of the oſſa cuneiformia.

NAVIDAD, a port-town of Mexico, in the province of Mechoachan: weſt long. 110°, and north lat. 19°.

NAUGRACUT, a city of the hither India, the capital of a province of the ſame name: eaſt long. 78°, and north lat. 33°.

NAVIGATION, the art of conducting or carrying a ſhip from one port to another. See the article SHIP.

Navigation implies not only the mechanical art of managing the ſails, and working a ſhip; that is, of cauſing it to obſerve ſuch motions and directions, as are aſſigned by the navigator; which muſt be learned on ſhip-board, and in the practice of ſailing: but likewiſe the theory thereof, which depends on the navigator's being before-hand furniſhed with the following elements.

1. A table of the latitudes and longitudes or the moſt remarkable parts of the ſea-coaſts, iſlands, rocks, ſhoals, &c. in the frequented parts of the world. See the articles LATITUDE and LONGITUDE.

2. Maps and charts of the ſeas and lands, together with the depths of water, and the times

times and ſetting of the tides upon the coaſt he may have occaſion to approach near. See CHART, MAP, TIDES, &c.

3. The uſe and application of ſeveral inſtruments, neceſſary to point out the way the ſhip is to ſteer, to meaſure the rate ſhe runs at, and to find the place ſhe is in at any time. See the articles COMPASS, LOG, BACK-STAFF, FORE-STAFF, QUADRANT, &c.

4. A ſufficient ſtock of mathematical learning, to enable him to make a right uſe of the obſervations that may be deduced from the preceding elements; but, particularly trigonometry. See the article TRIGONOMETRY.

Before we come to the particular methods of navigation, called plane-ſailing, middle-latitude ſailing, Mercator's ſailing, &c. we ſhall explain what is meant by the terms courſe, diſtance, &c. Thus, let A (plate CLXXXVI. fig. 1. n° 1.) be a place on the earth's ſurface, and A C its meridian; and ſuppoſe a ſhip to ſail from A, on the N. E. rhumb, till ſhe arrive at B: then the angle C A B, repreſents the courſe; A B the diſtance ſailed; A C, the difference of latitude, in this caſe called northing; and C B, the departure. Hence it is plain, that the diſtance ſailed will always be greater than either the difference of latitude or departure; it being the hypothenuſe of a right-angled triangle, whereof the other two are the legs. But if a ſhip ſails either due north or ſouth, ſhe ſails on a meridian, makes no departure, and her diſtance and difference of latitude are the ſame. If a ſhip ſails either due eaſt or weſt, ſhe runs on a parallel of latitude, makes no difference of latitude, and her departure and diſtance are the ſame. When the courſe is 45°, or 4 points, as in the above example, the difference of latitude and departure are equal. When the courſe is leſs than 45°, the difference of latitude is greater than the departure; and, *vice verſa*, when the courſe is greater than 45°.

When a figure relating to a ſhip's courſe is to be conſtructed, it muſt, firſt be conſidered, whether the ſhip is ſailing northward or ſouthward, and whether ſhe goes to the eaſtward or weſtward of the place from which ſhe departs. Thus, let the upper part of the paper, of whatever the figure is drawn on, always repreſent the north, then the lower part will be the ſouth, the right hand ſide the eaſt, and the left ſide the weſt; and the lines repreſenting the difference of latitude, departure, and diſtance, are to be drawn and denominated accordingly.

Plain, or *Plane-Sailing*, is that method of navigating a ſhip, which ſuppoſes the earth to be an extended plane, as explained under the article CHART.

Caſe I. One latitude, courſe, and diſtance ſailed, being given; to find the other latitude, and departure from the meridian.

Example: Suppoſe a ſhip in the latitude of 4° 10′ N. ſails S. S W. 194 miles; required the latitude ſhe is in, and how far ſhe hath departed from her former meridian?

Geometrically: Let the place of the ſhip be O (plate XL. fig. 5.) draw the meridian O P, and the right line O Q, forming an angle with the meridian O P = 22° 30′ = 2 points, the courſe ſteered; ſet off, on the line O Q, 194 miles, the diſtance ſailed, from O to Q; from the point Q let fall the perpendicular Q P, on the meridian O P, and the triangle is conſtructed; and the lines O P and P Q, the difference of latitude and departure, may be meaſured by applying them to graduated lines on the chart, or to the ſame ſcale of equal parts which O Q was taken from.

Arithmetically: 1. For the difference of latitude, or ſide O P, the proportion will be;

As radius = 90° - - - -	= 10.0000000
To the diſtance ſailed O Q = 194 - -	= 2.2878017
So is the co-ſine of the courſe = 67° 30′ = angle Q -	= 9.5616153
To the difference of latitude O P = 179 - - -	= 2.2534170

2. For the departure, or ſide P Q, the proportion is;

As radius = 90° - - - -	= 10.0000000
To the diſtance ſailed O Q = 194 - - -	= 2.2878017
So is the ſine of the courſe 22° 30′ = angle O -	= 9.6006997
To P Q, the departure required = 77 - - -	= 1.8885014

Caſe II.

BRITISH MUSEUM

Fig. 1. NAVIGATION.

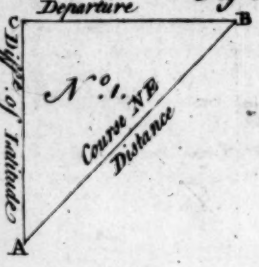


Fig. 2. Dipping-Needle

Fig. 3. NEPER'S RODS

N°. 1.

1	1	2	3	4	5	6	7	8	9	0
2	2	4	6	8	10	12	14	16	18	0
3	3	6	9	12	15	18	21	24	27	0
4	4	8	12	16	20	24	28	32	36	0
5	5	10	15	20	25	30	35	40	45	0
6	6	12	18	24	30	36	42	48	54	0
7	7	14	21	28	35	42	49	56	63	0
8	8	16	24	32	40	48	56	64	72	0
9	9	18	27	36	45	54	63	72	81	0

N°. 2.

1	4	7	6	8
2	8	14	12	16
3	12	21	18	24
4	16	28	24	32
5	20	35	30	40
6	24	42	36	48
7	28	49	42	56
8	32	56	48	64
9	36	63	54	72

Fig. 4. NOCTURNAL

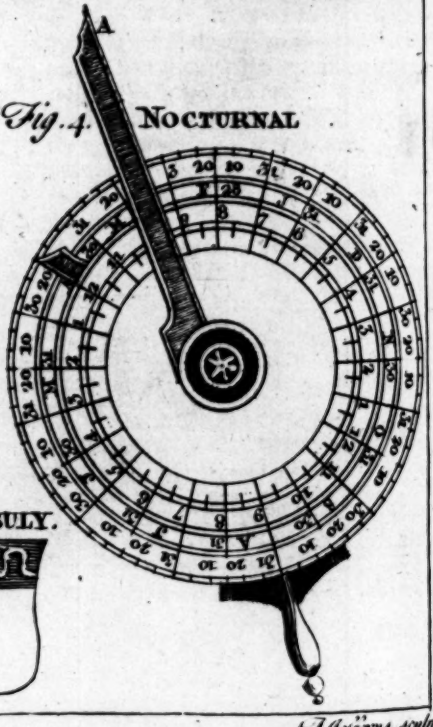


Fig. 5. the OLIVE-PRESS.

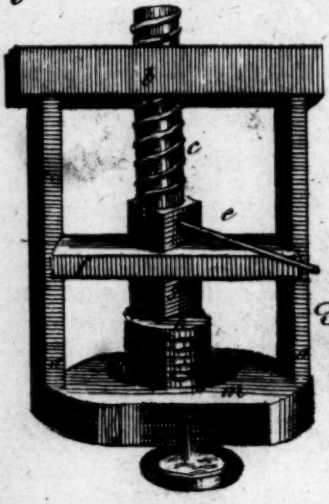


Fig. 6. NEBULY.

J. Gwynn sculp.

Caſe II. Both latitudes and courſe being given, to find the diſtance and departure.

Example: Suppoſe a ſhip in the latitude 3° 10′ S. ſails N. E. by N. till her difference of latitude be 2° 20′; required the diſtance ſailed, and departure from the meridian?

Geometrically: Let R *(ibid.)* be the place the ſhip ſailed from, on the chart; draw the meridian R S, ſetting off on it 140 miles = the difference of latitude, from R to S; and erecting the perpendicular S T, draw the rhumb-line R T, making an angle with the meridian R S = 33° 45′ = the courſe ſteered, continuing it till it cut the perpendicular in T; then will T be the place of the ſhip on the chart; and the diſtance R T, and departure S T, may both be meaſured by applying them to the graduated lines, or the ſame ſcale R S was taken from.

Arithmetically: 1. To find the diſtance ſailed, it will be;

As the complement of the courſe = 56° 15′ = the angle T	= 9.9198464
To the difference of latitude = 140 = R S - -	= 2.1461280
So is radius = 90° - - - -	= 10.0000000
To the diſtance required = 168.4 = R T - -	= 2.2262816

2. For the departure, the proportion will be;

As radius = 90° - - - -	= 10.0000000
To the diſtance R T = 168.4 - - -	= 2.2262816
So is the ſine of the courſe, or angle R = 33° 45′ -	= 9.7447390
To S T, the departure required = 93.5 - -	= 1.9710206

Caſe III. Both latitudes and diſtance ſailed being given, to find the courſe and departure.

Example: Admit a ſhip, in the latitude of 1° S. ſails between the north and eaſt 96 miles, till her difference of latitude be 1° 10′; required the courſe and departure?

Geometrically: Let V. *(ibid.)* be the place the ſhip ſailed from, on the chart; draw the meridian V W, ſetting off on it 70, the difference of latitude, from V to W; and erecting the perpendicular W X, take the diſtance ſailed between the points of the compaſſes, and, ſetting one foot in V, with the other croſs the perpendicular in X, which will be the place the ſhip is arrived at, on the chart; and the courſe or angle W V X, may be meaſured by the line of chords, and the departure W X, by applying it to the graduated lines on the chart, or to the ſame ſcale V X was taken from.

Arithmetically: 1. To find the courſe, or angle W V X, it will be;

As V X, the diſtance ſailed, = 96 - - -	= 1.9822712
To radius 90° - - - -	= 10.0000000
So is V W, the difference of latitude = 70 - -	= 1.8450980
To the ſine of the angle X, the complement of the courſe = 46° 49′	= 9.8628268

Which being taken from 90°, gives 43° 11′, the courſe ſteered; and becauſe the courſe was between the north and eaſt, it is N. 43° 11′ eaſterly, or nearly N. E. by N. three quarters eaſterly.

2. For the departure W X, the proportion will be;

As radius = 90° - - - -	= 10.0000000
To the diſtance V X = 96 - - -	= 1.9822712
So is the ſine of the courſe, or angle V = 43° 11′ -	= 9.8352688
To the departure W X = 65.7 - - -	= 1.8175400

Caſe IV. Both latitudes and departure being given, to find the courſe and diſtance.

Example: Suppoſe a ſhip, in the latitude 2° S. ſails between the ſouth and eaſt, till her difference of latitude be 2° 10′, and her departure 96 miles eaſt; required her direct courſe and diſtance?

Geometrically: Let *a (ibid.)* be the firſt place of the ſhip, on the chart; draw the meridian *a b*, ſetting off on it 130 miles, the difference of latitude from *a* to *b*, and erect the perpendicular *b c*, making it = 96 miles, the departure from the meridian; through the points *a* and *c*, draw a right line, and the triangle is conſtructed; and the angle *a*, may be meaſured by the line of chords, and the diſtance *a c*, by applying it to the graduated lines on the chart.

Arithmetically: 1. To find the courſe, the proportion will be;

As $a\,b$ the difference of latitude $= 130$ - - $= 2.1139434$
To radius $= 90°$ - - - - $= 10.0000000$
So is $b\,c$ the departure $= 96$ - - - $= 1.9822712$
To the T. of the angle a, the course required, $= 36° 27'$ $= 9.8683278$

Which, because she sailed between the south and east, is S. 36° 27′ easterly, or almost S. E. by S. one quarter easterly.

2. To find the distance sailed, the proportion will be;

As the sine of the course, or angle $a = 36° 27'$ - $= 9.7738749$
To the departure $b\,c = 96$ - - - - $= 1.9822712$
So is radius $= 90°$ - - - - $= 10.0000000$
To $a\,c$ the distance sailed $= 161.5$ - - - $= 2.2083963$

Case V. One latitude, distance, and departure being given, to find the other latitude and course steered.

Example: A ship at sea, in the latitude of 1° N. sails between the north and east 120 miles, having departed to the eastward of her former meridian 96 miles; required her direct course, and the difference of latitude?

Geometrically: Let d *(ibid.)* be the place of the ship; draw the meridian $d\,e$, and parallel to it, at the distance of the departure $= 96$, the line $f\,g$; take the distance sailed between the points of the compasses, and, setting one foot in d, with the other cross the former parallel in h, which will be the place the ship is arrived at; from the point h, let fall the perpendicular $h\,e$, and draw the right line $d\,h$; then will $d\,e$ be the difference of latitude, and the angle d, the course; both which may be measured as in the former case.

Arithmetically: 1. To find the course, the proportion will be;

As $d\,h$ the distance sailed $= 120$ - - - $= 2.0791812$
To radius $= 90°$ - - - - $= 10.0000000$
So is $e\,h$, the departure $= 96$ - - - $= 1.9822712$
To the sine of the course, or angle $d = 53° 7'$ - - $= 9.9030900$

That is, N. 53° 7′ easterly, or almost N. E. three quarters easterly.

2. For the difference of latitude the proportion will be;

As radius $= 90°$ - - - - $= 10.0000000$
To $a\,h$, the distance sailed $= 120$ - - - $= 2.0791812$
So is the co-sine of the course $= 53° 7'$ - - $= 9.7782870$
To $d\,e$, the difference of latitude $= 72$ - - $= 1.8574682$

Case VI. One latitude, course, and departure being given, to find the other latitude and distance sailed.

Example: Suppose a ship, in the latitude of 3° 10′ S. sails N. W. by N. till her departure be 90 miles; required her direct distance, and the latitude she is in?

Geometrically: Let k *(ibid.)* be the first place of the ship; draw the meridian $k\,l$, and the rhumb line $k\,m$, forming an angle with the meridian $= 33° 45'$, the course steered; at the distance of 90 miles, the departure, draw the line $n\,o$, parallel to $k\,l$; then will m be the place the ship is arrived at: from the point m, let fall the perpendicular $m\,l$; then will $k\,m$ be the distance, and $k\,l$, the difference of latitude; both which may be measured, by applying them to the graduated lines on the chart.

Arithmetically: 1. To find the distance sailed, the proportion will be;

As the sine of the course, or $\angle k = 33° 45'$ - - $= 9.7447390$
To the departure $l\,m = 90$ - - - $= 1.9542425$
So is radius $= 90°$ - - - - $= 10.0000000$
To the distance $k\,m = 162$ - - - - $= 2.2095035$

2. For the difference of latitude, the proportion will be;

As the tangent of the course, or $\angle k = 33° 45'$ - $= 9.8208926$
To the departure $l\,m = 90$ - - - $= 1.9542425$
So is the radius $= 90°$ - - - $= 10.0000000$
To $l\,k$ the difference of latitude $= 134.7$ - - $= 2.1293499$

This

This method of ſailing is extremely erroneous in high latitudes, and therefore is only fit to be uſed in the torid zone. However, being very ſimple and eaſy to be underſtood, we have given the ſeveral caſes of it firſt, that the young navigator may be accuſtomed to ſolve problems of this kind, both geometrically and by computation, before he applies himſelf to the following methods; in which we have contented ourſelves to give the ſeveral caſes, and proportions for ſolving them by means of logarithmic tables.

For the method of working traverſes, or courſes, ſee the article TRAVERSE.

Middle-Latitude Sailing, that method of navigation which is performed without meridional parts, by taking the middle-latitude; which method of ſailing, tho' not ſtrictly true, yet comes very near the truth, as will appear by comparing an example wrought by it, and by Mercator's ſailing.

The method of taking the middle latitude of two places is this: find the ſum of both their latitudes, and half that ſum will be the middle latitude required. Thus, the middle latitude of two places, one in 50°, and the other in 17° 10′ N. latitude, will be found to be 33° 35′; for $50° + 17° 10' = 67° 10'$; and $\frac{67° 10'}{2} = 33° 35'$.

Caſe I. The latitudes of two places, and their difference of longitude, being given, to find the direct courſe and diſtance.

Firſt, find the departure, by this proportion; as the radius is to the co-ſine of the middle parallel of latitude, ſo is the difference of longitude to the departure. Then for the courſe, it will be; as the difference of latitude is to the radius, ſo is the departure to the tangent of the courſe: and, laſtly, for the diſtance, we have this proportion; as the radius is to the difference of latitude, ſo is the ſecant of the courſe to the diſtance.

Caſe II. One latitude, courſe, and diſtance ſailed, being given to find the latitude and difference of longitude.

Firſt, to find the difference of latitude, by caſe I. of Plane-Sailing, the proportion is; as the radius to the diſtance, ſo is the co-ſine of the courſe to the difference of latitude: hence, the latitude come to being known, we have this analogy for finding the departure, *viz.* as the radius is to the diſtance, ſo is the ſine of the courſe to the departure: and, laſtly, for the difference of longitude, it will be, by Caſe II. of Parallel-Sailing; as the co-ſine of the middle parallel is to the radius, ſo is the departure to the minutes of difference of longitude.

Caſe III. Courſe and difference of latitude being given, to find the diſtance ſailed, and difference of longitude.

Firſt, for the departure, it will be, by Caſe II. of Plain-Sailing; as the radius is to the difference of latitude, ſo is the tangent of the courſe to the departure: then for the diſtance, by the ſame caſe; as the radius to the difference of latitude, ſo is the ſecant of the courſe to the diſtance: and, laſtly, for the difference of longitude, the proportion is, by Caſe II. of Parallel-Sailing; as the co-ſine of the middle parallel is to the departure, ſo is the radius to the minutes of difference of longitude.

Caſe IV. Difference of latitude and diſtance ſailed being given, to find the courſe and difference of longitude.

Firſt, for the courſe, by Caſe III. of Plain-Sailing, it will be; as the diſtance to the radius, ſo is the difference of latitude to the co-ſine of the courſe: then for the departure, by the ſame caſe; as the radius to the diſtance, ſo is the ſine of the courſe to the departure: and, laſtly, for finding the difference of longitude, we have by Caſe II. of Parallel-Sailing, this proportion; as the co-ſine of the middle parallel to the departure, ſo is the radius to the minutes of difference of longitude.

Caſe V. One latitude, courſe, and departure given, to find the difference of latitude, difference of longitude, and diſtance ſailed. Firſt, for the diſtance, by Caſe VI. of Plain-Sailing we have this analogy, *viz.* as the ſine of the courſe to the departure, ſo is the radius to the diſtance: then for the difference of latitude, by the ſame caſe; as the tangent of the courſe to the departure, ſo is the radius to the difference of latitude: and, laſtly, to find the longitude, by Caſe II. of Parallel-Sailing, we have this proportion, *viz.* as the co-ſine of the middle parallel to the departure, ſo is the radius to the minutes of difference of longitude.

Caſe VI. Difference of latitude and departure given, to find the courſe, diſtance, and difference of longitude.

Firſt, by Caſe IV. of Plain Sailing, we have this proportion for finding the courſe, *viz.* as the difference of latitude to the departure, ſo is the radius to the tangent of the courſe: and by the ſame caſe, for finding the diſtance; as the radius to the

difference of latitude, ſo is the ſecant of the courſe to the diſtance: and, laſtly, by Caſe II. of Parallel-Sailing, we have this proportion for finding the difference of longitude, *viz.* as the co-ſine of the middle parallel of latitude to the departure, ſo is the radius to the minutes of difference of longitude.

Caſe VII. Diſtance and departure given, to find difference of latitude, courſe, and difference of longitude.

Firſt, by caſe V. of Plain-Sailing, we have this proportion for finding the courſe; as the diſtance to the radius, ſo is the departure to the ſine of the courſe: and for the difference of latitude, by the ſame caſe; as the radius to the diſtance, ſo is the co-ſine of the courſe to the difference of latitude: and, laſtly, by Caſe II. of Parallel-Sailing, we have this proportion for finding the difference of longitude, *viz.* as the co-ſine of the middle parallel to the departure, ſo is the radius to the minutes of difference of longitude.

Caſe VIII. Difference of longitude and departure given, to find the difference of latitude, courſe, and diſtance ſailed.

Firſt, by Caſe III. of Parallel-Sailing, we have this proportion for finding the latitude come to; as the minutes of difference of longitude to the departure, ſo is the radius to the co-ſine of the middle parallel: now ſince the middle latitude is equal to half the ſum of the two latitudes, it follows, that if from double the middle latitude we ſubtract any one of the latitudes, the remainder will be the other; whence the difference of latitude being found, we have this proportion for finding the courſe, by Caſe IV. of Plain-Sailing, *viz.* as the difference of latitude to the radius, ſo is the departure to the tangent of the courſe: and, laſtly, by the ſame caſe, we have this analogy for finding the diſtance, *viz.* as the radius to the difference of latitude, ſo is the ſecant of the courſe to the diſtance.

Parallel-Sailing, is the art of finding what diſtance a ſhip ſhould run due eaſt or weſt, in ſailing from the meridian of one place to that of another given place, in any parallel of latitude.

This method of navigation is generally uſed in conducting a ſhip to an iſland, detached from the main land or other iſlands. The method of performing it is this: they ſail to the parallel of latitude the place is in, keeping a good account, ſo as to be certain whether the place is then to the eaſtward or weſtward; and alſo, if poſſible, to know the longitude arrived at; and then they run due weſt or eaſt, until the ſhip comes near the longitude of the given place, where ſhe is then ſure to make the port required.

The computations in parallel-ſailing depend on the following proportions, *viz.*

1. As the radius, R, is to the co-ſine of the latitude of any parallel, S; ſo is the miles of longitude between any two meridians, L, to the diſtance, D, of thoſe meridians in that parallel.

Demonſtration. Let P D F E (plate CLXXXVI. fig. 1. n° 2.) repreſent the fourth part of a ſphere, E being the center, P the pole, E D the radius of the equator, A B, *a b*, the two radii of parallels; then are P B D, P C *d*, quadrants of meridians, D *d* an arch of the equator interſected between them, and B C, *b c*, arches of parallels intercepted likewiſe between them; alſo the arches D B, D *b*, expreſs the latitudes of theſe parallels, reſpectively; and P B, P *b*, the complements of theſe latitudes.

Now the circumference of a circle whoſe radius is E D, is to the circumference of a circle whoſe radius is A B, as E D is to A B; that is, as the radius of the equator to the radius of the parallel, or as the radius to the co-ſine of the latitude. But like arches, D *d*, B C, intercepted between the ſame two meridians, are in the ſame ratio of their circumferences; therefore, an arch of the equator D *d*, is to a like arch B C, in any parallel of latitude, as the radius to the co-ſine of the latitude of that parallel. *Q. E. D.*

Hence it is eaſy to conſtruct a table, ſhewing the proportional diminution of the degrees of longitude in every latitude, from the equator to the poles; which the reader will find under the article LONGITUDE.

2. As the co-ſine of one latitude, S, is to the co-ſine of another latitude, *s*; ſo is a given meridional diſtance, in the firſt parallel D, to a correſponding meridional diſtance *d*, in the ſecond parallel.

This is evident.

And hence ariſes the following proportions, *viz.*

R : S : : L : D.
S : R : : D : L.
L : D : : R : S.
S : *s* : : D : *d*.
D : *d* : : S : *s*.

Whereby all the caſes that can happen in this kind of ſailing, are readily reſolved by

by logarithms; as alſo by the table given under the article LONGITUDE.

Example: How far muſt a ſhip ſail upon the parallel of 30° degrees latitude, in order to get one degree of longitude more weſtward?

As radius - - - - - - - - - -	90°. =	10.0000000
To the co-ſine of the latitude - - - - -	30° =	9.9375306
So is 1° of longitude, or 60 miles - - - - -	=	1.7781512
To the diſtance to be ſailed, or 51,96 miles - - - - -	=	1.7156818

And the like for any other latitude: but this diſtance might have been found by only looking into the table given under the article LONGITUDE.

Mercator's ſailing, that performed by Mercator's chart. See the article CHART.

Thus, let A and D (pl. CLXXXVI. fig. 1. n° 3.) repreſent two places upon the ſurface of the earth; AC being the meridian of A, and AD the rhumb-line between the two places: thro' D draw DB, perpendicular to AC, and this will be the parallel of latitude of the place D: from A ſet off, upon the meridian, the length AC, equal to the meridional, or enlarged difference of latitude; and through C, draw CE, parallel to BD, and meeting AD, produced in E; then AB will be the proper difference of latitude, AC the enlarged difference of latitude, or the difference of latitude according to Mercator's chart, between the places A and D; CE will be the difference of longitude, and BD the departure; alſo AD will be the proper diſtance, AE the enlarged diſtance, or according to Mercator's chart, and the angle BAD, will be the courſe. See MERIDIONAL, LATITUDE, LONGITUDE, *&c.*

Now ſince in the triangle ACE, BD is parallel to one of its ſides; it is plain the triangles ACE, ABD, will be ſimilar, and conſequently their ſides proportional: and hence ariſe the ſolutions of the ſeveral caſes in this ſailing.

Caſe. I. To find the meridional or enlarged difference of latitude between two places, whoſe latitudes by obſervation are given.

Of this caſe there are three varieties: 1. When one of the places lies on the equator; then the meridional difference of latitude is the ſame with the latitude of the other place, taken from the table of meridional parts. 2. When the two places are on the ſame ſide of the equator; then the meridional difference is found, by ſubtracting the meridional parts, anſwering to the leaſt latitude from thoſe anſwering to the greateſt, and the difference is that required. 3. When the places lie on different ſides of the equator, then the meridional difference of latitude is found by adding together the meridional parts anſwering to each latitude, and the ſum is that required.

Caſe II. To find the direct courſe and diſtance between two places, whoſe latitudes and longitudes are given.

Firſt, for finding the courſe, we have the following proportion, by Caſe IV. of Rectangular Trigonometry, *viz.* as AC, the meridional difference of latitude, is to CE, the difference of longitude; ſo is R, the radius, to T. BAD, the tangent of the courſe. Then to find the diſtance, by Caſe II. of Rectangular Trigonometry, we have this proportion, *viz.* as the radius R, is to AB, the proper difference of latitude; ſo is ſecant ∠ A, the ſecant of the courſe, to AD, the diſtance.

Caſe III. The courſe and diſtance ſailed being given, to find the difference of latitude and difference of longitude.

Firſt, for finding the difference of latitude by Caſe III. of Rectangular Trigonometry, we have this proportion, *viz.* as the radius is to the diſtance, ſo is the co-ſine of the courſe to the proper difference of latitude: and hence, it will be eaſy to find the meridional difference of latitude; and to find the difference of longitude, the proportion is; as the radius to the meridional difference of latitude, ſo is the tangent of the courſe to the minutes of difference of longitude.

Caſe IV. Both latitudes, *viz.* that ſailed from and come to, being given; to find the diſtance ſailed, and the difference of longitude.

Firſt, for the difference of longitude, the proportion will be; as the radius is to the enlarged or meridional difference of latitude, ſo is the tangent of the courſe to the minutes of difference of longitude. Then for the direct diſtance, the proportion is; as the radius to the proper difference of latitude, ſo is the ſecant of the courſe to the direct diſtance.

Caſe V. Both latitude and diſtance ſailed being given, to find the direct courſe and difference of longitude.

Firſt, for finding the angle of the courſe, the proportion is; as the proper difference of

of latitude is to the radius, ſo is the diſtance ſailed to the ſecant of the courſe: then, for the difference of longitude, it will be; as the radius to the meridional difference of latitude, ſo is the tangent of the courſe to the minutes of difference of longitude.

Caſe VI. One latitude, courſe, and difference of longitude being given: to find the other latitude, and diſtance ſailed.

Firſt, ſay; as the tangent of the courſe is to the radius, ſo is the minutes of difference of longitude to the enlarged difference of latitude; whence, by Caſe I. the minutes of difference of latitude may be found: then to find the direct diſtance, ſay; as the radius is to the proper difference of latitude, ſo is the ſecant of the courſe to the direct diſtance.

Caſe VII. One latitude, courſe, and departure being given; to find the other latitude, diſtance ſailed, and difference of longitude.

Firſt for the diſtance, the proportion is; as the ſine of the courſe is to the departure, ſo is the radius to the direct diſtance: then, for finding the proper difference of latitude, we have this analogy, *viz.* as the tangent of the courſe is to the departure, ſo is the radius to the proper difference of latitude: next, to find the difference of longitude, ſay; as the radius is to the meridional difference of latitude, ſo is the tangent of the courſe to the minutes of difference of longitude.

Caſe VIII. Both latitudes and departure being given, to find the courſe, diſtance, and difference of longitude.

Firſt, for the difference of longitude, the proportion is; as the proper difference of latitude is to the departure, ſo is the enlarged difference of latitude to the minutes of difference of longitude: next, for the courſe, it will be; as the proper difference of latitude is to the departure, ſo is the radius to the tangent of the courſe: and, laſtly, to find the diſtance, we have this analogy; as the ſine of the courſe is to the departure, ſo is the radius to the direct diſtance.

Caſe IX. One latitude, diſtance ſailed, and departure being given; to find the other latitude, difference of longitude, and courſe.

Firſt, for the courſe, ſay; as the diſtance is to the radius, ſo is the departure to the ſine of the courſe: next, for the difference of latitude, the proportion will be; as the radius to the diſtance, ſo is the ſine of the courſe to the difference of latitude; whence the meridional difference of latitude may be found: laſtly, to find the difference of longitude, ſay, as the proper difference of latitude is to the departure, ſo is the enlarged or meridional difference of latitude to the minutes of difference of longitude.

From what has been ſaid, it will be eaſy to ſolve a traverſe, by Mercator's ſailing. See TRIGONOMETRY and TRAVERSE.

Great-circle Sailing. See SAILING.

NAVIS, *argo navis*, or the ſhip Argo, in aſtronomy. See the article ARGO.

NAUMACHIA, in antiquity, a ſhew or ſpectacle among the antient Romans, repreſenting a ſea-fight.

NAUMBURG, a city of Germany, the capital of the county of Sax Naumburg, in Upper Saxony, ſituated in eaſt long. 12°, north lat. 51° 15′.

NAUSEA, in medicine, a reaching, or propenſity and endeavour to vomit, ariſing from a loathing of food, excited by ſome viſcous humour that irritates the ſtomach.

In this diſorder the patient is ſo far from deſiring aliment, that he rather loaths it. It either proceeds from a fault in the ſtomach, or elſe is derived from other diſeaſes, or is a ſymptom thereof, particularly acute inflammations, aſthma, dropſy, hypochondriac paſſion, *&c.* or when the humours are corrupted, and the ſpirits ſuppreſſed, in malignant diſeaſes. Vomiting in this caſe is proper, or purging when that is forbid. To theſe ſhould be joined ſtrengtheners of the ſtomach, and chiefly ſtomachic balſams, made of oil of nutmegs, and diſtilled oils, and ſtomachic plaſters. Hoffman ſays, that there is nothing better than mint, its ſpirituous water, and diſtilled oil; likewiſe maſtic and its ſpirit, or balſam of Peru diſtilled with ſalt of tartar. In acute fevers, eſpecially the malignant, epidemic, and ſpotted, there is generally a nauſea and reaching to vomit, for which reaſon emetics are good: likewiſe in the dyſentry, eſpecially when it is epidemic in a camp, emetics are not only uſeful, but neceſſary, with a ſlender diet. See EMETIC, FEVER, *&c.*

NAUTICAL PLANISPHERE, a deſcription of the terreſtrial globe upon a plane for the uſe of mariners, more uſually called chart. See the article CHART.

NAUTICAL COMPASS, the ſame with mariners-compaſs. See COMPASS.

NAUTICUS, in anatomy, is the name of

a muſcle, called alſo tibialis poſticus. See the article TIBIALIS.

NAUTILUS, in natural hiſtory, a ſimple ſhell, having no hinge, formed of one continued piece, rolled as it were into a ſpiral form, and having its cavity divided into a great number of cells by tranſverſe partitions, each of which has a perforation, and is continuous to the others, by means of a ſyphunculus carried the whole length of the ſhell. The animal inhabiting this ſhell is a ſepia.

Of the nautili, ſome are thick, and ſtrong; others, thin, light, and brittle; ſome are aurated, others are not ſo; and ſome are ſmooth on the external ſurface, and others furrowed.

NAVY, the fleet or ſhipping of a prince or ſtate. See the article FLEET.

The management of the britiſh navy royal, under the lord high admiral of Great Britain, is entruſted to principal officers and commiſſioners of the navy, who hold their places by patent. The principal officers of the navy are four, *viz.* the treaſurer, whoſe buſineſs it is to receive money out of the exchequer, and to pay all the charges of the navy, by warrant from the principal officers: comptroller, who attends and comptrols all payment of wages, is to know the rates of ſtores, to examine and audite all accounts, *&c.* ſurveyor, who is to know the ſtates of all ſtores, and ſee wants ſupplied, to eſtimate repairs, charge boatſwains, *&c.* with what ſtores they receive, and at the end of each voyage to ſtate and audite accounts: clerk of the acts, whoſe buſineſs it is to record all orders, contracts, bills, warrants, *&c.*

The commiſſioners of the navy are five: the firſt executes that part of the comptroller's duty which relates to the comptrolling the victuallers accounts; the ſecond, another part of the ſaid comptroller's duty, relating to the account of the ſtorekeepers of the yard; the third has the direction of the navy at the port of Portſmouth; the fourth has the ſame, at Chatham; and the fifth, at Plymouth.

There are alſo other commiſſioners at large, the number more or leſs, according to the exigencies of public affairs; and ſince the increaſe of the royal navy, theſe have ſeveral clerks under them, with ſalaries allowed by the king.

The victualling of the royal navy hath formerly been undertaken by contract, but is now managed by commiſſioners, who hold their office on Tower-hill, London.

For the ſeveral yards belonging to his majeſty's navy, ſee the article YARD.

The navy-office is where the whole buſineſs concerning the navy is managed, by the principal officers and commiſſioners.

The royal navy of Great Britain is now in a very flouriſhing ſtate; having been diligently kept up in late reigns, as the natural ſtrength of the kingdom. When it is complete, it is divided into three ſquadrons, diſtinguiſhed by the different colours of the flags carried by the reſpective admirals belonging to the ſame. See SQUADRON, FLAG, and ADMIRAL.

For the regulation and government of the navy, divers laws have been enacted from time to time; thus, in order to the ſupplying the navy with men, an act was made, 7 & 8 Will. III. cap. 21. for the regiſtering of ſeamen, to the number of thirty thouſand, for the king's ſervice; every ſeaman ſo regiſtered, to be allowed 40 s. *per ann.* bounty-money, whether he was in the ſervice or not, beſides his pay for actual ſervice; and it was provided that none but ſuch regiſtered mariners ſhould be capable of preferment to any commiſſion, *&c.* The perſons ſo regiſtred were exempted from ſerving on juries or in pariſh offices, as alſo from ſervice abroad after they were fifty-five years of age; and when they were diſabled for future ſervice, they were to be admitted into Greenwich hoſpital: and the widows of ſeamen, killed or drowned, were to be taken into the ſaid hoſpital, and their children educated, *&c.* See HOSPITAL.

As a farther encouragement for entering into the king's ſervice, it was enacted, 1 Geo. II. cap. 19. that if any ſeamen ſhall voluntarily enter his name with a commiſſion-officer belonging to the navy, to ſerve and appear on board a ſhip in fourteen days, *&c.* he ſhall have the uſual conduct-money, and be paid two months advanced wages. When ſeamen die in the ſervice, tickets ſhall be made out for their pay, which is to be paid immediately to the executors of the deceaſed. Bargains and aſſignments of ſeamen's pay are declared void; but their tickets for the ſame may be ſold. Perſons liſted in the navy, ſhall not be taken thereout by any proceſs at law, unleſs it be for ſome crime, or where the debt amounts to 20 l. *&c.*

NAXIA, or NIXIA, one of the iſlands of the Archipelago, about one hundred miles in circumference, ſituated in eaſt longit. 26°, and north lat. 36° 30'.

NAZAREANS, in church-history, a name originally given to all christians in general, on account that Jesus Christ was of the city of Nazareth; but afterwards restrained to a sect of heretics, whose religion consisted of a strange jumble of judaism and christianity; observing at the same time the mosaical law, and the several rites of the christian religion.

NAZARITES, among the Jews, persons who either of themselves, or by their parents, were dedicated to the observation of nazariteship. They were of two sorts: namely, such as were bound to this observance for only a short time, as a week or month; or those who were bound to it all their lives. All that we find peculiar in the latter's way of life, is, that they were to abstain from wine and all intoxicating liquors, and never to shave or cut off the hairs of their heads. The first sort of nazarites were moreover to avoid all defilement; and if they chanced to contract any pollution before the term was expired, they were obliged to begin afresh. Women as well as men might bind themselves to this vow.

NE ADMITTAS, in law, a writ directed to the bishop, at the suit of one that is patron of a church, where, on a quare impedit, &c. depending, he is doubtful that the bishop will collate his clerk, or admit the other's clerk, during the suit between them. This writ should be brought within six months after the church becomes void, and upon granting it, another writ is issued to the chief justice of the common pleas, to certify the king in chancery, whether there be any plea before him and the other justices, between the parties, &c.

NEALED, among seamen, is used when the sounding is deep water close to the shore, as also when the shore is sandy, clayey, ousey, or foul and rocky ground.

NEALING, or rather ANNEALING. See the article ANNEALING.

NEAP TIDES. See the article TIDES.

NEAPED. When a ship wants water so that she cannot get out of the harbour, off the ground, or out of the dock, the seamen say she is neaped, or beneaped.

NEAR, or NO NEAR, at sea, a word of command from him that cons the ship to the man at the helm, requiring him to let her fall to the leeward.

NEAT, or NET WEIGHT, the weight of a commodity alone, clear of the cask, bag, case, or even filth. See WEIGHT.

NEATH a, town of Glamorganshire, in south Wales, situated on the river Neath, near the Bristol-channel, twenty-eight miles north-west of Landaff.

NEBEL, in jewish antiquity, the same with the psaltery. See PSALTERY.

NEBULOUS, CLOUDY, in astronomy, a term applied to certain of the fixed stars, which shew a dim hazy light; being less than those of the sixth magnitude, and therefore scarce visible to the naked eye.

NEBULY, or NEBULE'E, in heraldry, is when a coat is charged with several little figures, in form of words, running within one another, or when the outline of a bordure, ordinary, &c. is indented or waved, as represented in pl. CLXXXVI. fig. 6.

NECESSARIO, in music. This word is prefixed to certain parts in music, as *a dui violini necessario*, *i. e.* that must be played by two violins. *Canto necessario* is used to signify much the same as concertante. See CONCERTANTE.

Every mode has certain chords, which may be called its necessary or essential chords.

NECESSARY, in a philosophical sense, that which cannot but be, or cannot be otherwise. See the next article.

NECESSITY, whatever is done by a necessary cause, or a power that is irresistible, in which sense it stands opposed to freedom. See the article FREEDOM.

The schools distinguish a physical necessity, and a moral necessity; and a simply absolute necessity, and a relative one. Physical necessity is the want of a principle, or of a natural means necessary to act, which is otherwise called a physical or natural impotence. Moral necessity is only a great difficulty, such as that arising from a long habit, a strong inclination, or violent passion. Simple or absolute necessity is that which has no dependence on any state or conjuncture, or any particular situation of things, but is found every where, and in all the circumstances in which the agent can be supposed; such as in a blind man, the necessity he is under of not distinguishing colours. Relative necessity, is that which places a man in a real incapacity of acting or not acting in those circumstances, and that situation he is found in, tho' in other circumstances, and in another state of things, he might act or not act; such, in the opinion of the jansenists, is the necessity of doing evil, in a man who with a violent passion has only a feeble grace to resist it; or the necessity of

of doing well in a man who having grace of ſeven or eight degrees of ſtrength, has only concupiſcence of two or three degrees to withſtand. All theſe kinds of neceſſity are oppoſite to freedom, or liberty; ſince even in the laſt it is as impoſſible for a man to act or not act, as if he were in a ſtate of abſolute and phyſical neceſſity.

The ſchoolmen admit of other ſpecies of neceſſity, antecedent, concomitant, conſequent, *&c.* Antecedent neceſſity, is that ariſing from an antecedent cauſe neceſſarily operating; ſuch is the neceſſity of the ſun's riſing to-morrow morning: Concomitant neceſſity ariſes from the antecedent and neceſſary cauſe, but depends upon the circumſtances of the effect; the effect all the while being free: thus it is neceſſary Peter ſit, ſuppoſing he is ſitting.

NECK, *collum*, in anatomy, is that ſlender part ſituated between the head and the trunk of the body.

The neck conſiſts of the following parts: 1. the common integuments: 2. ſeven vertebræ: 3. a number of muſcles which ſerve to move the head, the neck, the larynx, the pharynx, and the os hyoides: 4. a number of very large arteries, as the carotids, internal and external, and the vertebral ones: 5. of large veins, as the jugular, internal and external, and the vertebral ones: 6. of large nerves, of the par vagum, the intercoſtals, the recurrent, the diaphragmatics, and the vertebral: 7. a part of the ſpinal marrow: 8. the aſpera arteria, or trachea, particularly the larynx, in which is an eminence called the pomum adami: 9. the pharynx, with a part of the oeſophagus: 10. the thyroide, with ſome other ſmaller glands. See the articles LARYNX, PHARYNX, JUGULAR, *&c.*

Wounds of the NECK. The treatment of theſe wounds ought to be different, according to the different nature of the wound. When the common integuments and muſcular fleſh only are wounded, it will require to be treated in the ſame manner as other ſlight wounds. See the article WOUND.

Where the external jugular is wounded, the methods uſed after bleeding in that vein will be ſufficient. When the internal jugular vein is wounded, the hæmorrhage will be eaſily ſtopped by filling the wound with dry lint, or with the puff-ball or duſty muſhroom; laying over theſe applications ſquare bolſters, and ſecuring all with a bandage drawn as tight as the ſituation of the part will admit. Where this method has no effect, the ſurgeon ſhould make a proper preſſure on the wounded part with his finger, till the hæmorrhage is intirely ſtopped; the dreſſings applied are not to be removed for three days, and then a vulnerary balſam and plaſter is to be applied to heal the wound. In large wounds, or an intire diviſion of the internal jugular, the ſurgeon, if preſent, ſhould make a firm preſſure with his finger on the wounded part, and make inciſions lengthways above the wound, till he can get at the veſſel, and then make a firm ligature upon it, by the aſſiſtance of the crooked needle.

In caſe of a wound in the carotid artery, a ſurgeon, if preſent in time, ſhould uſe the ſame method as in thoſe of the internal jugular vein. This method is more likely to be attended with ſucceſs in wounds of the upper and middle part of the veſſel, than in thoſe of the lower part of it; and where the wound is not in the trunk of the artery, but in one of its branches near the head, you ſhould fill up the wound with lint dipt in ſome ſtyptic liquor, and then cover it up with thick compreſſes, ſecuring all with a tight bandage, and ordering an aſſiſtant to make a preſſure upon the part with his hand, for ſome time after: and in theſe caſes, the dreſſings are not to be removed till the third or fourth day.

In curing the wounds of the aſpera arteria, the ſurgeon ought to clean the wound, and then endeavour to unite the parts by the help of ſticking-plaſters; or where the wound is large, by making two ſtitches with a crooked needle, dreſſing the wounds afterwards in the uſual manner, and enjoining the patient to keep his head in a proper ſituation. The wound thus treated, will eaſily heal, if it has been made either by puncture, or a cutting inſtrument; but if it has been made by a bullet, and any part of the aſpera arteria is carried away, the ſuture is to no purpoſe: wounds of this kind are only to be dreſſed with the vulnerary balſams. If the aſpera arteria is intirely divided, and the lower end of it has ſhrunk into the cavity of the thorax, ſo that it cannot be laid hold on, and united to the upper part, there can be no remedy.

When the oeſophagus is wounded, what is taken in at the mouth comes out through

the wound, and the patient is uſually affected with hiccoughs and vomiting. When it is entirely divided, there is no remedy; but when it is only perforated, or wounded in part, the cure may be attempted by dreſſing it with the vulnerary balſams, endeavouring to unite it by means of ſticking-plaſters, and enjoining the patient a ſtrict abſtinence for ſome days, giving nouriſhing clyſters of broth or milk; but when the neceſſities of nature require nouriſhment to be taken by the mouth, the wound ſhould always be carefully cleaned afterwards, and dreſſed daily till it heals.

Wounds of the medulla ſpinalis are beſt dreſſed with balſam of peru, or medicines of the like nature, mixed with a ſmall quantity of honey of roſes, ſpread upon pledgits, and applied moderately warm. Slight ones of this kind are ſometimes healed by this means, but large ones in this part bring on certain death.

Luxation of the NECK. If life remain after ſuch an accident, the patient is to be immediately laid flat on the ground or floor; then the ſurgeon, laying hold of his head, is to extend it ſtrongly, gently moving it from ſide to ſide, till he finds that the neck is reſtored to its natural poſture. Mr. Petit mentions another method, by means of ſlings; but Heiſter gives the preference to the former method, both as being more ſimple, and becauſe the patient can be relieved much ſooner.

Wry NECK, a deformity uſually brought into the world with people; but ſometimes it is occaſioned by accidents afterwards. When it is from the birth, there is very little reaſon to imagine it curable, becauſe the vertebræ of the neck are rendered crooked by that poſture, while the bones are in a ſoft and pliable ſtate.

There are, however, in the writings of ſurgeons, ſome inſtances of this diſorder, even in theſe circumſtances, being cured after twelve, ſixteen, or eighteen years.

When this diſorder comes on adults, it is occaſioned generally either by the contraction of the ſkin from a burn on one ſide, or from a ſtrong ſpaſmodic contraction of one of the maſtoide muſcles; which will at length become ſhorter and indurated, by continuing in that poſture; or it may proceed from a relaxation of one or more of theſe muſcles, in conſequence of which the neck will be contracted by the ſtronger antagoniſt-muſcle on the oppoſite ſide; or laſtly, it may proceed from a preternatural ligament drawing down the head. And when either of theſe is the occaſion of the diſorder, there is hopes of a cure; eſpecially if the patient be young, and the diſorder not of long ſtanding.

If this diſorder be recent, and cauſed by a defluxion of humours, evacuating medicines, with mild ſudorifics, and heat, may be of ſervice. But when it ariſes from a contraction of the ſkin or muſcles by burning, the repeated uſe of oils, ointments, and fomentations, may relax ſo far as to make a cure. A proper firm bandage muſt be applied to pull the head toward the natural poſture, and a ſteel-collar may be contrived, by which the patient will be ſuſpended very frequently till the neck recover its proper poſition. But when all theſe fail, the manual aſſiſtance of the ſurgeon is to be called in.

If the ſkin is contracted by a burn, it muſt be carefully incided tranſverſely in ſeveral places, and the inciſions dreſſed ſo as to keep them open and dilated, and the head pulled to its proper poſition by a bandage, till the new fleſh filling up theſe inciſions, gives room for the head to ſtand even. But if the wry-neck proceeds from a contraction of one of the maſtoide muſcles, or from ſome ligament, they are to be divided by a tranſverſe inciſion in their lower part, near the clavicle or ſternum.

NECKAR, a river of Germany, which riſes in the ſouth part of the circle of Swabia, and falls into the Rhine at Manheim.

NECROMANCY, a ſpecies of divination, performed by raiſing the dead, and extorting anſwers from them. See the article DIVINATION.

NECROSIS, in medicine, a term ſometimes uſed for a mortification, or ſphacelus. See the article SPHACELUS.

NECTAR, νεκταρ, among antient poets, the drink of the fabulous deities of the heathens, in contradiſtinction from their ſolid food, which was called ambroſia. See the article AMBROSIA.

This word is alſo uſed by ſome of the antients to expreſs honey.

NECTARINE, a fruit differing nothing from the common peach, of which it is a ſpecies, than in having a ſmoother rind and a firmer pulp. See PERSICA.

NECTARIUM, among botaniſts, expreſſes what is ſometimes only a part of the corolla, and ſometimes, though more rarely, the whole: it is a part deſtined for

for the reception of the honey-juice of the plant, and is very various in its figure; being ſometimes only a hollow in a petal, ſometimes a little ſquama or tubercle, and ſometimes a plain tube.

NECYDALIS, in zoology, a genus of the coleoptera claſs of inſects, the antennæ of which are ſetaceous; the exterior wings are dimidiated, and there are interior or membranaceous ones.

NEEDHAM, a market town of Suffolk, ſituated on the river Orwel, eight miles north-weſt of Ipſwich.

NEEDLE, *acus*, a very common little inſtrument or utenſil, made of ſteel, pointed at one end, and pierced at the other, uſed in ſewing, embroidery, tapeſtry, *&c.* Needles make a very conſiderable article in commerce, though there is ſcarce any commodity cheaper, the conſumption of them being almoſt incredible. The ſizes are from n° 1. the largeſt, to n° 25. the ſmalleſt. In the manufacture of needles, german and hungarian ſteel are of moſt repute. In the making them, the firſt thing is to paſs the ſteel thro' a coal-fire, and, under a hammer, to bring it out of its ſquare figure into a cylindrical one. This done, it is drawn through a large hole of a wire-drawing-iron, and returned into the fire, and drawn through a ſecond hole of the iron, ſmaller than the firſt, and thus ſucceſſively, from hole to hole, till it has acquired the degree of fineneſs required for that ſpecies of needles, obſerving every time it is to be drawn that it be greaſed over with lard, to render it more manageable. The ſteel thus reduced to a fine wire, is cut in pieces of the length of the needles intended. Theſe pieces are flatted at one end on the anvil, in order to form the head and eye; they are then put into the fire to ſoften them farther, and thence taken out and pierced at each extreme of the flat part on the anvil, by force of a puncheon of well-tempered ſteel, and laid on a leaden block to bring out, with another puncheon, the little piece of ſteel remaining in the eye. The corners are then filed off the ſquare of the heads, and a little cavity filed on each ſide of the flat of the head: this done, the point is formed with a file, and the whole filed over: they are then laid to heat red hot on a long flat narrow iron, crooked at one end, in a charcoal fire, and when taken out hence, are thrown into a baſon of cold water to harden. On this operation a good deal depends: too much heat burns them, and too little leaves them ſoft: the medium is learned by experience. When they are thus hardened, they are laid in an iron-ſhovel on a fire, more or leſs briſk in proportion to the thickneſs of the needles; taking care to move them from time to time. This ſerves to temper them, and take off their brittleneſs: great care here too muſt be taken of the degree of heat. They are then ſtraitened one after another with the hammer, the coldneſs of the water uſed in hardening them having twiſted the greateſt part of them. The next proceſs is the poliſhing them. To do this they take twelve or fifteen thouſand needles, and range them in little heaps againſt each other on a piece of new buckram ſprinkled with emery-duſt. The needles thus diſpoſed, emery-duſt is thrown over them, which is again ſprinkled with oil of olives; at laſt the whole is made up into a roll, well bound at both ends. This roll is then laid on a poliſhing-table, and over it a thick plank loaden with ſtones, which two men work backwards and forwards a day and a half, or two days, ſucceſſively; by which means the roll thus continually agitated by the weight and motion of the plank over it, the needles withinſide being rubbed againſt each other with oil and emery, are inſenſibly poliſhed. After poliſhing they are taken out, and the filth waſhed off them with hot water and ſoap: they are then wiped in hot bran, a little moiſtened, placed with the needles in a round box, ſuſpended in the air by a cord, which is kept ſtirring till the bran and needles be dry. The needles thus wiped in two or three different brans, are taken out and put in wooden veſſels, to have the good ſeparated from thoſe whoſe points or eyes have been broke either in poliſhing or wiping: the points are then all turned the ſame way, and ſmoothed with an emery-ſtone turned with a wheel. This operation finiſhes them, and there remains nothing but to make them into packets of two hundred and fifty each.

Needles the dozen thouſand pay, on importation, 11 *l.* $6\frac{60}{100}$ *d.* and, on exportation, draw back 10 *s.* $1\frac{50}{100}$ *d.* Pack-needles the thouſand pay, on importation, 2 *s.* $6\frac{80}{100}$ *d.* and draw back, on exportation, 2 *s.* 3 *d.* Sail-needles the thouſand pay, on importation, 1 *s.* $3\frac{45}{100}$ *d.* and draw back, on exportation, 1 *s.* $1\frac{50}{100}$ *d.*

Chirurgeon's NEEDLE. There are many caſes wherein the uſe of the needle is highly

highly neceſſary; in ſome of which a cure cannot be completed without it, as in wounds of the belly, and in divided tendons. In amputations they are found much preferable to the actual cautery; and in the operation of the aneuriſm, bubonocele, lithotomy, &c. they very much forward the cure; and in a cataract and hare-lip, the cure is wholly performed by them; for a deſcription of the different needles uſed in the cure of each of theſe two laſt diſorders, ſee the articles COUCHING and HARE-LIP.

Chirurgical needles are of different figures and ſizes; being ſtraight, crooked and flat; and all of them very ſharp, and moſtly made of well-tempered metal: thoſe needles uſed for ſetons, and generally for the future of tendons, and for the ſewing up of dead bodies, muſt be ſtraight. In amputation, and all other ſort of wounds, the crooked ſort are uſed. Mr. Monro, in the Medical Eſſays, obſerves, that needles of ſilver pierce more eaſily in ſtitching arteries after amputation, than thoſe made of ſteel. See the article LITHOTOMY.

Magnetical NEEDLE, in navigation, a needle touched with a loadſtone, and ſuſtained on a pivot or center; on which playing at liberty, it directs itſelf to certain points in or under the horizon; whence the magnetical needle is of two kinds, *viz.* horizontal and inclinatory. See the article MAGNET.

Horizontal needles are thoſe equally balanced on each ſide the pivot that ſuſtains them; and which, playing horizontally with their two extremes, point out the north and ſouth points of the horizon. For their application and uſe, ſee the article COMPASS.

In the conſtruction of the horizontal needle a piece of pure ſteel is provided, of a length not exceeding ſix inches, leſt its weight impede its volubility, very thin, to take its verticity the better, and not pierced with any holes, or the like, for ornament ſake, which prevent the equable diffuſion of the magnetic virtue. A perforation is then made in the middle of its length, and a braſs-cap or head ſoldered on, whoſe inner cavity is conical, ſo as to play freely on a ſtyle or pivot headed with a fine ſteel-point. The north point of the needle in our hemiſphere is made a little lighter than the ſouthern; the touch always deſtroying the balance, if well adjuſted before, and rendering the north end heavier than the ſouth, and thus occaſioning the needle to dip.

The method of giving the needle its verticity or directive faculty, has been ſhewn already under the article MAGNET; but if after touching, the needle be out of its equilibrium, ſomething muſt be filed off from the heavier ſide, till it balance evenly.

Needles in ſea-compaſſes are uſually made of a rhomboidal or oblong form: we have given their ſtructure already under the article COMPASS.

The needle is not found to point preciſely to the north except in very few places, but deviates from it more or leſs in different places, and that too at different times, which deviation is called its declination or variation from the meridian. See the article VARIATION.

Inclinatory or dipping-needle, a magnetical needle ſo hung as that inſtead of playing horizontally and pointing out north and ſouth, one end dips or inclines to the horizon, and the other points to a certain degree of elevation above it. Or a dipping-needle may be defined, with Mr. Whiſton, to be a long ſtraight piece of ſteel (plate CLXXXVI. fig. 2.) every way poiſed on its center, and afterwards touched with a loadſtone, but ſo contrived as not to play on the point of a pin, as does the common horizontal needle, but to ſwing in a vertical plane, about an axis parallel to the horizon; and this to diſcover the exact tendency of the power of magnetiſm.

The inventor of the dipping-needle, Mr. Whiſton obſerves, was without all queſtion one Robert Norman, a compaſs-maker at Wapping in London; who having had a cuſtom of finiſhing and hanging the needles of his compaſſes before he touched them, always found that immediately after the touch, the north point would bend or decline downward under the horizon, inſomuch that to balance the needle again, he was always forced to put a piece of wax on the ſouth end, as a counterpoiſe. The conſtancy of this effect led him at length to obſerve the preciſe quantity of the dip, or to meaſure the greateſt angle the needle would make with the horizon. This, in the year 1576, he found at London to be 71° 50′: but the dip varies as well as the horizontal direction, and is now found at the ſame place to be about 75°. Burrows, Gilbert, Ridley, Bond, &c. endeavour to apply this diſcovery of the dip to the finding

finding of the latitude; and the laſt author going further, likewiſe propoſed the finding of the longitude thereby, but for want of obſervations and experiments, he could go no length. The late Mr. Whiſton being furniſhed with the further obſervations of colonel Windham, Dr. Halley, Mr. Pound, Mr. Cunningham, Pere Noel, Pere Feuillee, and his own, improved very much upon this doctrine and uſe of the dipping-needle, brought it into more certain rules, and endeavoured in good earneſt to find the longitude thereby. In order to this he obſerves, 1. That the true tendency of the north or ſouth end of every magnetic needle is not to that point in the horizon to which the horizontal needle points, but towards another directly under it in the ſame vertical; and in different degrees under it in different ages, and in different places. 2. That the power by which a horizontal needle is governed, and all our navigation ordinarily directed, is proved to be but one quarter of the power by which the dipping-needle is moved, which ſhould render the latter far the more effectual and accurate inſtrument. 3. That a dipping-needle a foot long, will plainly ſhew an alteration of the angle of inclination in thoſe parts of the world in half a quarter of a degree, or 7½ geographical miles: *i. e.* ſuppoſing that diſtance taken along or near a meridian. And a needle of four feet, in two or three miles. 4. A dipping-needle four feet long in theſe parts of the world, will ſhew an equal alteration along a parallel, as one of a foot long will ſhew along a meridian: *i. e.* this will with equal exactneſs ſhew the longitude, as that the latitude. This depends on the poſition of the lines of equal dip in theſe parts of the world, which are found to be about fourteen or fifteen degrees from the parallels. Hence he argues, that as we can have needles of five, ſix, ſeven, eight or more feet long, which will move with ſtrength ſufficient for exact obſervation, and ſince microſcopes may be applied to the viewing the ſmalleſt diviſions of degrees on the limb of the inſtrument, it is evident that the longitude at land may be found thereby to leſs than four miles; and as there has been many obſervations made at ſea with the ſame inſtrument by Noel, Feuillee, &c. which have determined the dip uſually within a degree, ſometimes within ½ or ¼ of a degree, and this with ſmall needles of five or ſix or at the moſt nine inches long, it is evident the longitude may be found even at ſea to leſs than half a quarter of a degree. This much premiſed, the obſervation itſelf follows.

To find the longitude or latitude by the dipping-needle. If the lines of equal dip below the horizon be drawn on maps or ſea-charts from good obſervations, it will be eaſy from the longitude known, to find the latitude, and from the latitude known, to find the longitude either at ſea or land.

Suppoſe, for example, you were travelling or ſailing along the meridian of London, and found the angle of dip with a needle of one foot to be 75°, the chart will ſhew that this meridian and the line of dip meet in the latitude 53° 11′, which therefore is the latitude ſought. See the article LATITUDE.

Or ſuppoſe you were travelling or ſailing along the parallel of London, that is in 51° 32′ north latitude, and you find the angle of dip to be 74°. The parallel and the line of this dip will meet in the map in 1° 46′ of eaſt longitude from London, which is therefore the longitude ſought. See the article LONGITUDE.

About the year 1700, Dr. Halley publiſhed a ſea-chart, on which the lines of variation are delineated: but as experience has ſhewn, that the variation is in a perpetual ſtate of fluctuation, at leaſt in the greateſt part of the world, it is therefore neceſſary that the lines of variation be often corrected. About the year 1744, Mr. Montaine and Mr. Dodſon found, on a careful examination, that the variation lines conſtructed by Dr. Halley were become entirely uſeleſs; and that, in order to render this chart uſeful to the mariner, it was neceſſary to conſtruct a new ſyſtem of theſe lines, or ſomething analogous to them every ten or twelve years at leaſt; accordingly, about the year 1744, they republiſhed Dr. Halley's chart with new variation lines. In 1755, they made a new conſtruction; thoſe of 1744 being become erroneous by time; and in 1759, they publiſhed an account of the methods uſed to deſcribe lines on Dr. Halley's chart, ſhewing the variation of the magnetic needle, about the year 1756, in all the known ſeas, and the application and uſe of theſe lines in correcting the longitude at ſea.

As the mutation of the magnetical variation is remarkably irregular in different parts of the world, the only method of conſtructing a variation chart, is by collecting

lecting a large number of obſervations made by artiſts in their voyages, and tranſferring them to the chart, which was the method theſe gentlemen purſued.

In 1755, was publiſhed a table of the quantity of variation, from the year 1660 to 1860, at ſeveral places, computed, after many years intenſe application, by Mr. Williams, who was perſuaded he had diſcovered a method of calculating the variation at any given place and time.

NEEDLE-FISH, a ſpecies of ſyngnathus, with the middle of the body hexangular, and the tail pinnated. See the article SYNGNATHUS.

The males and females of this ſpecies, as well as of the ſea-adder, another ſpecies of the ſyngnathus, are eaſily diſtinguiſhed; the females carrying a kind of long bag, reaching from the anus halfway to the tail; there are numerous eggs in this, at the proper ſeaſon they are full, of the ſize of rape-ſeed, and of a whitiſh colour; they neither are ſo numerous, nor at all reſemble in their arrangement or diſpoſition the eggs of the generality of the other fiſhes of this claſs; this may indeed be in ſome degree ſaid to be viviparous, for the rudiment of the fœtus is in ſome meaſure animated before it is diſcharged from the veſica or bag.

NEEDLE-SHELL, in natural hiſtory, the ſlender turbo, with ventricoſe ſpires, and a ſmall round mouth. See TURBO.

NEEDLES, two capes, or head-lands, at the weſt end of the iſle of Wight, which is very difficult to paſs on account of the ſands and rocks.

NE EXEAT REGNUM, or more properly, NE EXEAT REGNO, in law, a writ for reſtraining a perſon from going out of the kingdom, without the king's licence. It may be directed either to the ſheriff, to cauſe the party to find ſurety that he will not depart the realm, or to the party himſelf; and in that caſe, if he goes, he is liable to be fined. If a ſuit be depending in the court of chancery, and the plaintiff is afraid that the defendant will fly abroad, he may have this writ; in which the defendant muſt give bond to the maſter of the Rolls, in the penalty of 1000 l. or ſome ſuch ſum, for ſubmitting to the writ, or elſe he muſt ſatisfy the court, by anſwer, affidavit, or otherwiſe, that he has no deſign of leaving the kingdom, and enter into ſecurity accordingly.

NEFASTI DIES, in roman antiquity, an appellation given to ſuch days wherein it was not allowed to adminiſter juſtice, uſually marked in the calender by N. or N. P. *i. e.* nefaſtus prima, when only nefaſtus for the firſt part of it. See FASTI.

NEGAPATAN, a port-town of the hither India, ſituated on the coaſt of Coromandel: eaſt long. 79°, north lat. 11° 15′.

NEGATION, in logic, an act of the mind, affirming one thing to be different from another; as, that the ſoul is not matter.

NEGATIVE, in general, ſomething that implies a negation: thus we ſay, negative quantities, negative ſigns, negative powers, *&c.* See the articles QUANTITY, SIGN, POWER, *&c.*

Our words and ideas, ſays Dr. Watts, are ſo unhappily linked together, that we can never know which are poſitive, which negative ideas, by the words that expreſs them: for ſome poſitive terms denote a negative idea, as dead; and there are both poſitive and negative terms invented to ſignify the ſame and contrary ideas, as unhappy and miſerable. To this may alſo be added, that ſome words, which are negative in the original language, ſeem poſitive in engliſh, as *abyſs*. The way therefore to know whether any idea be negative or not, is to conſider whether it primarily implies the abſence of any poſitive being, or mode of being; if ſo, then it is a negative idea, otherwiſe a poſitive one.

According to logicians, the only way to prove a negative, is by converting it into an affirmative.

NEGATIVE PREGNANT, a negative that implies or brings forth an affirmative; as where a perſon is impleaded to have done a certain thing on ſuch a day, *&c.* and denies the thing generally, without alleging any thing farther; it is a negative pregnant plea, becauſe ſuch pleading may nevertheleſs imply that he did it in ſome ſort.

NEGOMBO, a port-town on the weſt coaſt of the iſle of Ceylon, in the indian ocean, ſubject to the Dutch: eaſt long. 78°, north lat. 7° 25′.

NEGRAIS, a port-town of Pegu, in the further India, ſituated on the weſt ſide of the bay of Bengal: eaſt long. 92° 30′, north lat. 17°.

NEGRIL POINT, the moſt weſterly promontory of the iſland of Jamaica.

NEGROES, properly the inhabitants of Nigritia

Nigritia in Africa, alſo called blacks and moors; but this name is now given to all the blacks.

The origin of the negroes, and the cauſe of this remarkable difference from the reſt of the human ſpecies, has much perplexed the naturaliſts: Mr. Boyle has obſerved, that it cannot be produced by the heat of the climate: for though the heat of the ſun may darken the colour of the ſkin, yet experience does not ſhew that it is ſufficient to produce a true blackneſs, like that of the negroes.

In Africa itſelf, many nations of Æthiopia are not black, nor were there any blacks originally in the Weſt-Indies. In many parts of Aſia, under the ſame parallel with the african region, inhabited by blacks, the people are but tawney. He adds, that there are negroes in Africa beyond the ſouthern tropic, and that a river ſometimes parts nations, one of which is black and the other only tawney. Dr. Barriere alledges, that the gall of negroes is black, and being mixed with their blood, is depoſited between their ſkin and ſcarf-ſkin. However, Dr. Mitchel, of Virginia, in the Philoſophical Tranſactions, n° 476, has endeavoured by many learned arguments to prove, that the influence of the ſun in hot countries, and the manner of life of their inhabitants, are the remote cauſes of the colour of negroes, indians, *&c.* and indeed it would be a ſtrong confirmation of his doctrine, if we could ſee any people, originally white, become black and woolly by tranſplantation, or *vice verſa*.

Negroes are brought from Guinea, and other coaſts of Africa, and ſent into the colonies in America, to cultivate tobacco, ſugar, indigo, *&c.* and in Mexico and Peru, to dig in the mines; and this commerce, which is ſcarce defenſible on the foot either of religion or humanity, is now carried on by all the nations that have ſettlements in the Weſt-Indies. Thoſe negroes make the beſt ſlaves, who are brought from Angola, Senegal, Cape Verd, the river Gambia, the kingdoms of Joloffes, Daniel, Galland, *&c.*

There are various ways of procuring them: ſome, to avoid famine, ſell themſelves, their wives and children, to their princes, or other great men: others are made priſoners of war; and great numbers are ſeized in excurſions made for that very purpoſe by the petty princes, upon one another's territories, in which it is uſual to ſweep away all, without diſtinction of age or ſex.

NEGRO-CAPE, a promontory of Angola, on the weſt coaſt of Africa: eaſt long. 14°, ſouth lat. 17°.

NEGROES-ISLAND, one of the Philippine Iſlands, in the Indian Ocean, ſubject to Spain; ſo called, becauſe moſt of the inhabitants are blacks: eaſt long. 120°, north lat. 10°.

NEGROLAND, or NIGRITIA, a country of Africa, which lies between 18° weſt, and 15° eaſt longitude, and between 10° and 20° of north latitude, the great river Niger running through it. It is bounded by Zaara, or the deſart, on the north; by unknown countries on the eaſt; by Guinea, on the ſouth; and by the Atlantic Ocean on the weſt.

NEGROPONT, or EGRIPOS, the capital of the iſland of Negropont, antiently called Euboea, ſituated in the Archipelago, on the weſt ſide of the iſland; where the ſtrait is ſo narrow, that it is joined to the continent by a bridge: eaſt long. 24° 30′, north lat. 38° 30′.

NEHEMIAH, a canonical book of the Old Teſtament, ſo called from the name of its author. Nehemiah was born at Babylon, during the captivity, and ſucceeded Ezra in the government of Judah and Jeruſalem. He was a Jew, and was promoted to the office of cup-bearer to Artaxerxes Longimanus, king of Perſia; when the opportunities he had of being daily in the king's preſence, together with the favour of Eſther the queen, procured him the favour of being authorized to repair and fortify the city of Jeruſalem, in the ſame manner as it was before its deſtruction by the Babylonians. On his going to Jeruſalem, he finiſhed the rebuilding of the walls in fifty-two days, and dedicated the gates of the city with great ſolemnity. He then reformed ſome abuſes which had crept in among his countrymen, particularly the extortion of the uſurers, by which the poor were ſo oppreſſed as to be forced to ſell their lands and children for ſupport: after which he returned to Perſia, and came back again with a new commiſſion, by virtue of which he regulated every thing relating both to the ſtate and religion of the Jews. The hiſtory of theſe tranſactions is the ſubject of this book.

NEIF, *nativa*, in law-books, denotes a ſhe-villain. See the article VILLAIN.

NE INJUSTE VEXES, in law, a writ that lies for a tenant, who is diſtrained by his

his lord for more ſervices than he is obliged to perform; being a prohibition to the lord, not to diſtrain, or vex, his tenant.

NEISSE, a town of Sileſia, ſituated on a river of the ſame name, forty-three miles ſouth of Breſlaw.

NEIVA, a river of Muſcovy, on which the capital city of Peterſburg ſtands, which falls into the gulph of Finland.

NELLENBURG, a city of Swabia, in Germany, capital of a county of the ſame name, ſituated fifteen miles north of Conſtance.

NELSON'S FORT, a fort and ſettlement on the weſt ſide of Hudſon's Bay: weſt long. 91°, north lat. 57°.

NEMÆA, a town in the Morea, thirty miles ſouth of Corinth, where the antient nemæan games were celebrated.

NEMÆAN GAMES, were ſo called from Nemæa, a village between the cities of Cleonæ and Philus, where they were celebrated every third year. The exerciſes were chariot-races, and all the parts of the pentathlum. Theſe games were inſtituted in memory of Opheltes, or Archemorus, the ſon of Euphetes and Creuſa, and nurſed by Hypſipyle; who leaving him in a meadow, while ſhe went to ſhew the beſiegers of Thebes a fountain, at her return found him dead, and a ſerpent twined about his neck: whence the fountain, before called Langia, was named Archemorus; and the captains, to comfort Hypſipyle, inſtituted theſe games. Others aſcribe their inſtitution to Hercules, after his victory over the nemæan lion.

NEMINE CONTRADICENTE, *none contradicting it*, a term chiefly uſed in parliament when any thing is carried without oppoſition.

NEMOURS, a city in the iſle of France, forty-two miles ſouth of Paris: eaſt long. 2° 45′, north lat. 48° 17′.

NENIA, or NÆNIA, in antient poetry, a mournful kind of ſong, filled with the praiſes of ſome deceaſed perſon, and ſung during the celebration of the funeral. See the article FUNERAL.

NEOMENIA, or NOUMENIA, a feſtival of the antient Greeks, at the beginning of every lunar month, which was, as the name imports, obſerved upon the day of the new moon, in honour of all the gods, but eſpecially Apollo, who was called Neomenios; becauſe the ſun is the fountain of light, and whatever diſtinction of times and ſeaſons may be taken from other planets, yet they are all owing to him as the original of thoſe borrowed rays by which they ſhine.

The games and public entertainments at theſe feſtivals, were made by the rich, to whoſe tables the poor flocked in great numbers. The Athenians at theſe times offered ſolemn prayers and ſacrifices for the proſperity of their country during the enſuing month. See the article GAMES.

The Jews had alſo their neomenia, or feaſt of the new moon, on which peculiar ſacrifices were appointed, and on this day they had a ſort of family entertainment and rejoicing. The moſt celebrated neomenia of all others was that at the beginning of the civil year, or firſt day of the month Tiſri, on which no ſervile labour was performed: they then offered particular burnt-ſacrifices, and ſounded the trumpets of the temple. The modern jews keep the neomenia only as a feaſt of devotion, which any one may obſerve or not as he pleaſes.

NEOPHYTES, new plants, a name given by the antient Chriſtians to thoſe heathens who had newly embraced the faith; ſuch perſons being conſidered as regenerated, or born anew by baptiſm. The term neophytes has been alſo uſed for new prieſts, or thoſe juſt admitted into orders, and ſometimes for the novices in monaſteries. It is ſtill applied to the converts made by the miſſionaries among the Infidels.

NEOTTIA, BIRD'S NEST, in botany, a genus of the gynandria diandria claſs of plants, the flower of which conſiſts of five ovato-oblong petals, connivent at the points: the nectarium is undivided, equal in length to the petals, and furniſhed with a denticulation on each ſide; the fruit is a rugoſe, oblong, capſule, containing a great number of ſeeds.

NEPA, the leſſer furz, in botany, a ſpecies of geniſta ſpartium.

NEPA, the WATER SCORPION, in zoology, a genus of four winged inſects, the roſtrum whereof is inflected, the antennæ formed into a kind of claws; the wings cruciated, and the legs four in number. This is a large inſect, near an inch in length, and about half its length in breadth; its body is of a kind of elliptic form, very flat and thin, and its tail long and pointed; the body is compoſed of ſeveral joints, and the anus is remarkably large.

NEPENTHES, in botany, a plant of the gynandria-tetrandria claſs, without any flower petals: the fruit is an oblong, columnar, truncated capſule, containing numerous ſeeds.

NEPENTHES, νηπενθες, is alſo a medicine, mentioned by Homer, as moſt efficacious againſt grief and ſorrow: he ſays, that whoever ſhould take it mixed with wine, could not be ſenſible of grief for that whole day, though his father or mother were to die.

NEPER's RODS, or BONES, an inſtrument invented by J. Neper, baron of Merchiſton, in Scotland, whereby the multiplication and diviſion of large numbers are much facilitated.

As to the conſtruction of NEPER'S RODS: ſuppoſe the common table of multiplication to be made upon a plate of metal, ivory, or paſte-board, and then conceive the ſeveral columns (ſtanding downwards from the digits on the head) to be cut aſunder; and theſe are what we call Neper's rods for multiplication. But then there muſt be a good number of each; for as many times as any figure is in the multiplicand, ſo many rods of that ſpecies (*i. e.* with that figure on the top of it) muſt we have; though ſix rods of each ſpecies will be ſufficient for any example in common affairs: there muſt alſo be as many rods of 0's.

But before we explain the way of uſing theſe rods, there is another thing to be known, *viz.* that the figures on every rod are written in an order different from that in the table. Thus, the little ſquare ſpace or diviſion in which the ſeveral products of every column are written, is divided into two parts by a line acroſs from the upper angle on the right to the lower on the left; and if the product is a digit, it is ſet in the lower diviſion; if it has two places, the firſt is ſet in the lower, and the ſecond in the upper diviſion; but the ſpaces on the top are not divided: alſo there is a rod of digits, not divided, which is called the index rod, and of this we need but one ſingle rod. See the figure of all the different rods, and the index, ſeparate from one another, in plate CLXXXVI. fig. 3. n° 1.

Multiplication by NEPER'S RODS: firſt lay down the index rod; then on the right of it ſet a rod, whoſe top is the figure in the higheſt place of the multiplicand: next to this again, ſet the rod, whoſe top is the next figure of the multiplicand; and ſo on in order, to the firſt figure. Then is your multiplicand tabulated for all the nine digits; for in the ſame line of ſquares ſtanding againſt every figure of the index rod, you have the product of that figure, and therefore you have no more to do but to tranſfer the products and ſum them. But in taking out theſe products from the rods, the order in which the figures ſtand obliges you to a very eaſy and ſmall addition: thus, begin to take out the figure in the lower part, or unit's place, of the ſquare of the firſt rod on the right: add the figure in the upper part of this rod to that in the lower part of the next, and ſo on, which may be done as faſt as you can look on them. To make this practice as clear as poſſible, take the following example.

Example: To multiply 4768 by 185. Having ſet the rods together for the number 4768 (*ibid.* n° 2.) againſt 5 in the index, I find this number, by adding according to the rule. - - 23840
Againſt 8, this number. - - 38144
Againſt 3, this number. - - 14304
Total product. 1835680

To make the uſe of the rods yet more regular and eaſy, they are kept in a flat ſquare box, whoſe breadth is that of ten rods, and the length that of one rod, as thick as to hold ſix (or as many as you pleaſe) the capacity of the box being divided into ten cells, for the different ſpecies of rods. When the rods are put up in the box (each ſpecies in its own cell diſtinguiſhed by the firſt figure of the rod ſet before it on the face of the box near the top) as much of every rod ſtands without the box as ſhews the firſt figure of that rod: alſo upon one of the flat ſides without and near the edge, upon the left hand, the index rod is fixed: and along the foot there is a ſmall ledge, ſo that the rods when applied are laid upon this ſide, and ſupported by the ledge, which makes the practice very eaſy; but in caſe the multiplicand ſhould have more than 9 places, that upper face of the box may be made broader. Some make the rods with four different faces, and figures on each for different purpoſes.

Diviſion by NEPER'S RODS: firſt tabulate your diviſor; then you have it multiplied by all the digits, out of which you may chooſe ſuch convenient diviſors as will be next leſs to the figures in the dividend, and write the index anſwering in the quotient,

quotient, and ſo continually till the work is done. Thus 2179788 divided by 6123, gives in the quotient 356.

Having tabulated the diviſor, 6123, you ſee that 6123 cannot be had in 2179; therefore take five places, and on the rods find a number that is equal, or next leſs to 21797, which is 18369; that is, 3 times the diviſor, wherefore ſet 3 in the quotient, and ſubſtract 18369 from the figures above, and there will remain 3428; to which add 8, the next figure of the dividend, and ſeek again on the rods for it, or the next leſs, which you will find to be five times; therefore ſet 5 in the quotient, and ſubtract 30615 from 34288, and there will remain 3673; to which add 8, the laſt figure in the dividend, and finding it to be juſt 6 times the diviſor, ſet ſix in the quotient.

```
6123)2179788(356
     18369..
     -----
      34288
      30615
      -----
       36738
       36738
       -----
       00000
```

NEPETA, the tall white ſideritis, or catmint, in botany, a genus of the didynamia gymnoſpermia claſs of plants; the corolla whereof conſiſts of a ſingle ringent petal, the tube is cylindric and incurvated, and the limb dehiſcent; the faux is patent, cordated and terminating in two ſhort ſegments; the upper lip is erect, roundiſh and emarginated; the lower one is a roundiſh, concave, large, entire and ſerrated; there is no pericarpium, but the ſeeds, which are roundiſh, and four in number, are contained in the cup.

Catmint has been greatly recommended as an uterine and nervous medicine. The people in the country ſtill frequently uſe it in form of an infuſion for theſe purpoſes, but in the ſhops it is only kept as an ingredient in ſome compoſitions.

NEPHEW, a term relative to uncle and aunt, ſignifying a brother or ſiſter's ſon; who, according to the civil law, is in the third degree of conſanguinity, but according to the canon in the ſecond.

NEPHRITIC, ſomething that relates to the kidneys. See KIDNEYS.

NEPHRITIC STONE, *lapis nephriticus*. See the article LAPIS.

NEPHRITIC WOOD, *lignum nephriticum*, a wood of a very denſe and compact texture, and of a fine grain, brought us from New Spain, in ſmall blocks, in its natural ſtate, and covered with its bark. It is to be choſen of a pale colour, ſound and firm, and ſuch as has not loſt its acrid taſte; but the ſureſt teſt of it is the infuſing it in water: for a piece of it infuſed only half an hour in cold water, gives it a changeable colour, which is blue or yellow, as variouſly held to the light. If the vial it is in be held between the eye and the light, the tincture appears yellow; but if the eye be placed between the light and the vial, it appears blue. We often meet with this wood adulterated with others of the ſame pale colour; but the duſkiſh black hue of the bark, is a ſtriking character of this.

The tree is the coatli of Hernandez. It grows to the height of our pear-tree, and its wood while freſh is much of the ſame texture and colour; the leaves are ſmall and oblong, not exceeding half an inch in length, or a third of an inch in breadth; the flowers are ſmall, and of a pale yellow, and oblong ſhape, ſtanding in ſpikes: the cups they ſtand in are divided into five ſegments at the edge, and are covered with a reddiſh down. This is the beſt deſcription of the tree that can be collected from what has been hitherto written of it; no body having had an opportunity of taking its true characters.

This wood is a very good diuretic, and is ſaid to be of great uſe with the Indians in all diſeaſes of the kidneys and bladder, and in ſuppreſſions of urine, from whatever cauſe. It is alſo recommended in fevers and obſtructions of the viſcera. The way of taking it, among the Indians, is only an infuſion in cold water.

NEPHRITICS, in pharmacy, medicines proper for diſeaſes of the kidneys, eſpecially the ſtone. See STONE.

Such particularly are the roots of althæa, dog's graſs, aſparagus, ſago, pellitory of the wall, mallows, pimpinella, red chick-peaſe, peach-kernels, turpentine, the nephritic ſtone, the nephritic wood, &c. and diuretics. See DIURETICS. &c.

NEPHRITIS, in medicine, an inflammation of the kidneys. See the article INFLAMMATION.

The ſymptoms of the nephritis, according to Boerhaave, are a great inflammatory, pungent, burning pain in the place where the kidneys are ſituated, attended with a fever. The urine is made often, but ſmall in quantity, and very red, or flame-coloured, yet in the higheſt degree of the diſeaſe, watery.

There

There is a numbneſs of the thigh, a pain in the groin, and the teſticle of the ſame ſide, a pain in the ilium, bilious vomiting, and continual eructations.

When the inflammation is deep, ſays Hoffman, the fever violent, the burning pain in the loins laſting, the difficulty of making water great, the body very coſtive, the anxiety and ſtraitneſs of the precordia exquiſite, the urine crude and white, and finally when the pain continues to the fourteenth day, the kidney will ſuppurate, which is known from the abatement of the pain, and from the thick, purulent ſediment of the urine. This will ſometimes laſt ſeveral years, till there is nothing left of the kidney but a bag. This is attended with a hectic fever, and the patient before he dies is almoſt reduced to a ſkeleton. If the bag happens to burſt, it brings on a retention of urine, and intolerable pains, which end in death.

When the diſeaſe is favourable, it is cured, according to Boerhaave, by reſolution, or a copious red and thick urine diſcharged at one time; or, by a large flux of blood from the hæmorrhoidal veins, in the beginning of the diſeaſe. It is cured alſo by plentiful bleeding, revulſion, and dilution; and by ſoft emollient, antiphlogiſtic decoctions. Hoffman thinks emollient clyſters without any ſaline or purging ſtimulus, the principal help in this diſeaſe. They may be made of milk, whey, or ſoft water, in which elder and camomile-flowers have been boiled; to which add an ounce or two of ſyrup of marſh-mallows, and a dram of nitre. The body ſhould be kept open with oil of ſweet almonds; and wind in the bowels ſhould be diſcuſſed, for which purpoſe cumin ſeeds made into comfits are proper. When there are convulſions, or exceſſive pains, Boerhaave ſays, that opiates are proper; and that, if the vomiting, a ſymptom of this diſeaſe, is too frequent, warm water ſweetened with honey, is beneficial. The patient ſhould avoid all acrimonious aliment; he ſhould neither lie too hot, nor on his back. By this method likewiſe, a nephritis ariſing from a ſtone in the kidney, or ureters, may be cured. When an abſceſs is formed, the medicines muſt be powerfully maturating and emollient. When the urine appears purulent, they muſt be diuretics of medicated waters, whey, and the like, together with balſamics. In this caſe, Hoffman recommends emulſions of the four cold ſeeds and ſweet almonds: ſome attribute a great virtue to cherry-tree gum diſſolved in whey and water, and taken often. A ſyrup of marſh-mallows is very uſeful; add to theſe the decoction of veronica, ſweetened with honey, mixt with powder of nutmegs.

Arbuthnot ſays, that butter-milk, not very ſour, has been reckoned a great ſecret in ulcers of the kidneys; and that chalybeat waters have been beneficial to ſome: he ſays, that ſpruce-beer is a good balſamic in this caſe, and adviſes ſoft malt liquors rather than wine. If the diſeaſe ends in a ſchirrus, there will be a palſey, or a lameneſs of the adjacent thigh, ſays Boerhaave, as alſo an incurable evil; whence will proceed a renal tabes. When there is a ſudden remiſſion of the pain, a cold ſweat, a weak intermitting pulſe, hiccoughing, a ſtoppage of urine; or when it is livid, black, full of hairs, fetid, abounding with brown or black caruncles, and a ſudden loſs of ſtrength, there is a mortal gangrene.

NEPHROTOMY, a ſpecies of lithotomy. See the article LITHOTOMY.

NEPOTISM, a term uſed in Italy, in ſpeaking of the authority which the popes nephews and relations have in the adminiſtration of affairs, and of the care the popes take to raiſe and enrich them. Many of the popes have endeavoured to reform the abuſes of nepotiſm, which at preſent is ſaid to be aboliſhed.

NEREIDS, in the pagan theology, ſea-nymphs, daughters of Nereus and Doris. Heſiod reckons up fifty of them; and Homer *Paſ. σ. v.* 39. *& ſeq.* gives us a liſt and deſcription of thirty-nine nereids: Virgil's liſt of the nereids is ſhorter, but diverſified with pretty circumſtances, as may be ſeen *Georg. lib.* iv. *v.* 336 *& ſeq.*

The nereids were eſteemed very handſome, inſomuch that Caſſiope, the wife of Cepheus, king of Ethiopia, having triumphed over all the beauties of the age, and daring to vie with the nereids, they were ſo enraged that they ſent a prodigious ſea-monſter into the country; and to appeaſe them ſhe was commanded by the oracle to expoſe her daughter Andromeda, bound to a rock, to be devoured by the monſter.

In antient monuments the nereids are repreſented riding upon ſea-horſes, ſome-

times with an entire human form, and, at other times, with the tail of a fiſh.

NEREIS, in the hiſtory of ſhell-fiſh, the ſame with the ſtomatia. See STOMATIA.

NEREIS, in the hiſtory of inſects, a genus of inſects of the order of the gymnarthria, the body of which is of a cylindric figure, and the tentacula four in number, but two of them are uſually very ſhort, and often ſcarce perceptible.

NERICIA, a province of Sweden, bounded by Weſtmania, on the north; by Sunderland, on the eaſt; and by Gothland on the ſouth and weſt.

NERIUM, the ROSE BAY, in botany, a genus of the pentandria-monogynia claſs of plants, the corolla whereof conſiſts of a ſingle infundibuliform petal; the tube is cylindric, and ſhorter than the cup; the limb is very large and divided into five broad, obtuſe, oblique ſegments; the fruit conſiſts of two cylindric, acuminated, long, erect folicles, formed each of one valve, and opening longitudinally; the ſeeds are numerous, oblong, coronated with a downy matter, and placed in an imbricated manner.

NERVES, *nervi*, in anatomy, are cylindrical whitiſh parts, uſually fibroſe in their ſtructure; or compoſed of cluſters of filaments, ariſing from the brain, or rather from its medulla oblongata within the ſkull, and from the ſpinal marrow, and running from thence to every part of the body.

Structure and uſe of the NERVES. This is eaſily perceived in moſt of the larger, and ſome of the ſmaller ones: for beſides the blood-veſſels they receive, and the membranes they are ſurrounded with, they are ſeen to be compoſed of a fibrous matter: or, as it were, of bundles or cluſters of white, cylindrical, and very ſlender filaments; which, on the ſtricteſt examination, appear to be ſolid, and without any cavity. Liewenhoeck indeed affirms, that he had often found a cavity in them; but he is not free from errors in many of his microſcopical obſervations. But though we cannot diſcover any cavity, much leſs a fluid contained in them; yet it is very poſſible that there may be ſuch cavities, and ſuch a fluid, only too ſmall to be perceived by us: and for the actual exiſtence of ſuch a fluid, known by the name of animal ſpirits, many probable arguments are adduced.

The great uſe of the nerves, therefore, though we are not able perfectly to demonſtrate it, ſeems to be to convey to all parts of the body a fluid of an extremely ſubtile kind, ſecreted in the brain and ſpinal marrow, and deſtined for no leſs noble a purpoſe than the ſenſation, motion, and nutrition of the ſeveral parts of the whole human fabric. Thoſe who would enter farther into this ſubject, may conſult Heiſter's Anatomy, Boerhaave's chapter on the brain, in his inſtitutes; Morgagni's Adverſar. where he treats it judiciouſly and deeply; and after theſe, Burggrave on the exiſtence of the animal ſpirits. See alſo the article BRAIN.

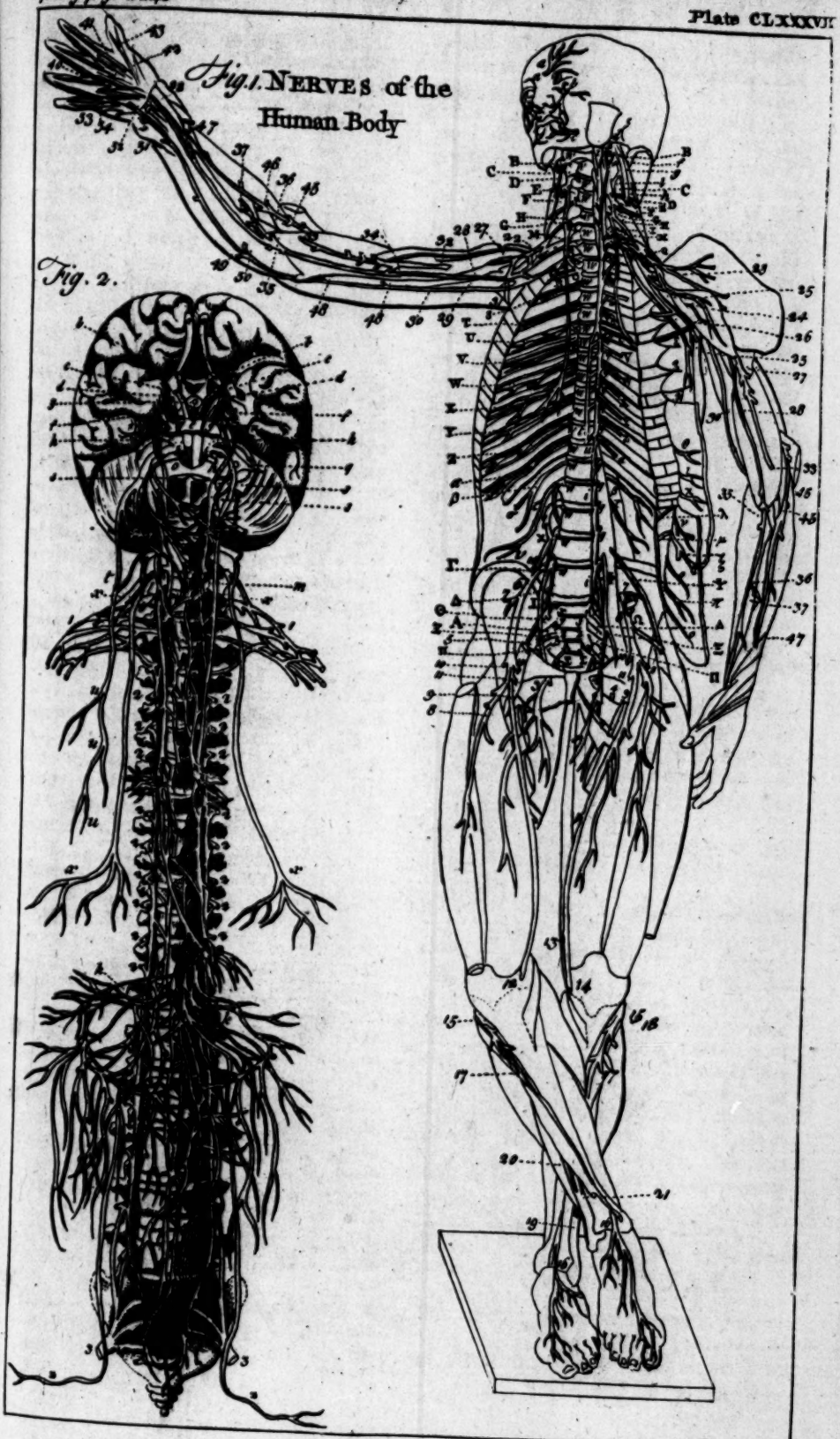
The antients found, that by cutting, tying or compreſſing any nerve, or any other way intercepting its communication with the brain, the parts to which it belonged were immediately deprived of all ſenſe and motion. One remarkable inſtance of this is, the making an animal dumb by tying the nerves near the wind-pipe. We read in Galen, of a boy who became quite dumb by having both the recurrent nerves divided. The experiment of cutting theſe nerves in brute animals, was repeated and confirmed by Veſalius; and Dr. Martin aſſures us, he tried it ſucceſsfully on a pig; nor did the animal recover its voice, as ſome have ſuſpected it might. As the voice depends on a proper aperture of the glottis, it ſeems likely that, when the recurrent nerves are cut, the glottis will always ſtand open, and be incapacitated from being ſhut at the will of the animal. An anonymous phyſician offers what he calls an experimentum crucis, in proof of the nerves being compoſed of cylindrical canals, containing a fluid: it is the demonſtration of the optic nerve inflated and dried, which appears canular to the naked eye. See the article EXPERIMENTUM CRUCIS.

Origin, diſtribution, and names of the NERVES. The nerves are uſually divided into two kinds, thoſe which ariſe from the brain, and thoſe ariſing from the ſpinal marrow. See plate CLXXXVII. fig. 1 and 2.

The nerves of the brain are nine pair. 1. The olfactory pair, (*ibid.* fig. 2. *a*, *a*.) which paſſing through the os cribroſum, are ſpread over the membrane of the noſtrils. 2. The optic pair, (*ibid. b*, *b*.) which by their expanſion form the retina of the eye. 3. The motary pair of the eyes, (*ibid. c*, *c*.) each of which is divided, near the orbit, into ſix parts, or branches;

Fig. 1. NERVES of the Human Body

Fig. 2.



J. Jeffreys sculp.

BRITISH MUSEUM

branches; of which, in human ſubjects, the firſt branch goes to the elevator palpebræ; the ſecond, to the elevator of the eye; the third, to the depreſſor; the fourth, to the adducent; the fifth to the inferior oblique muſcle; and the ſixth, into the tunics of the eye: but, in other animals, they are divided much otherwiſe. 4. The pathetic pair of Willis, *(ibid. d, d.)* which are very ſmall, and run to the trochlear muſcle of the eye. 5. The guſtatory pair, which are very large, and divided within the cranium into three branches, *(ibid. f, f.)* immediately under the dura mater: of theſe the firſt branch, called the ophthalmic, runs to various parts of and about the eye, the eye-lids, the muſcles of the forehead and noſe, and the integuments of the face. The ſecond branch may be called the ſuperior maxillary one, as being finally diſtributed through all parts of the upper jaw, the lips, noſe, palate, uvula, gums, teeth: a branch of it alſo runs to the ear, and joining with a branch of the ſeventh pair, forms the chorda tympani. The third branch may be called the maxillaris inferior, as being diſtributed over the ſeveral parts of the lower jaw, the tongue, and other parts of the mouth; whence the whole pair of nerves has obtained the name of par guſtatorium; though a great part of them ſerves to very different purpoſes, and is carried to parts that have nothing to do with taſting. 6. The abducent pair, *(ibid. g, g.)* except a branch for the formation of the intercoſtal nerve, is wholly carried to the abducent muſcle of the eye; whence its name. The intercoſtal nerve *(ibid.* fig. 1 and 2, *i, i, i, l, m,* &c.) is formed either of ramifications of the two preceding nerves, or only of thoſe of the ſixth pair. It makes its way out of the cranium by the paſſage of the internal carotid, and deſcends near the eighth pair through the neck; and thence through the breaſt and abdomen, even to the pelvis; and in its way, makes various plexuſes and ganglia, and ſends branches to almoſt all the parts contained in the breaſt and abdomen. 7. The auditory pair, *(ibid. b, b.)* ariſe with two trunks; the one of which is called the portio dura, or hard portion; the other the portio mollis, or ſoft portion. This laſt enters the foramen of the os petroſum, and thence through various little apertures gets into the labyrinth of the ear, where it is expanded over all its parts, and conſtitutes the primary organ of hearing. The harder portion, paſſing the aquæduct of Fallopius, ſends back one branch into the cavity of the cranium: it alſo ſends off another branch, which helps to form the chorda tympani; and others to the muſcles of the tympanum. The reſt of this pair goes to the external ear; the pericranium, the muſcles of the os hyoides, the lips, the eye-lids, and the parotids. 8. The par vagum *(ibid. k, k, k.)* with the acceſſorius of Willis, paſs out near the lateral ſinuſes of the dura mater, and, deſcending through the neck and thorax to the abdomen, ſend out branches by the way to the larynx, the pharynx, the heart, the lungs, and eſpecially to the ſtomach. It alſo ſends off from the upper part of the thorax, large branches, which are variouſly implicated in the neck, thorax, and abdomen, with the linguals, the cervicals, and the intercoſtals. 9. The lingual pair go immediately to the tongue, and are called by ſome the motary nerves of the tongue; but by others, with more juſtice, the guſtatory nerves.

We are to obſerve, ſays Heiſter, that the pair of nerves, which the generality of writers have called the tenth pair of the head, are, for many unanſwerable reaſons, to be properly called the firſt pair of nerves of the neck.

Of the nerves which ariſe from the ſpinal marrow, they are properly thirty-two pair.

Thoſe of the neck are no leſs than eight pair; and from them there are innumerable branches diſtributed through the muſcles of the head, the neck, the ſcapula, and the humerus, marked A, B, C, D, &c. to O, O, the eighth and laſt pair: from the third, fourth, and fifth pair are formed the nerves of the diaphragm; and the ſixth, ſeventh, and eighth pair, together with P P, the firſt pair of the back, form the ſix robuſt nerves of the arms and hands. To this diviſion is the acceſſory ſpinal nerve of Willis to be referred, which ariſes about the origin of the third or fourth pair.

The nerves of the back are twelve pair marked P P, Q Q, R, S, &c. to Z and α, β, &c. which, beſides the branch they give to the brachial nerves, run entirely in the ſame furrow along the courſe of the ribs, and are diſperſed over the pleura,

pleura, the intercoſtal, pectoral, and abdominal muſcles, the breaſt, and other parts of the thorax.

The nerves of the loins are five pair, marked τ, φ, ω, Γ, Θ; with their branches, υ, χ, ψ, &c. Theſe are in general diſperſed over the loins, the peritonæum, and the integuments and muſcles of the abdomen: and beſides this, their firſt pair often gives, on each ſide, a branch to the diaphragm. The ſecond pair after inoſculating with the branches of the firſt, third, and fourth pair, forms the crural nerves, 6 6, 7 7, 8 8, &c. which are diſtributed over the anterior part of the thigh: and in the ſame manner, a branch is formed of the conjunctions of the ſecond, third, and fourth pair, which paſſes through the great foramen of the os pubis to the ſcrotum, the teſticles, and the adjoining parts. The fourth and fifth pair of the nerves of the loins, joining with the firſt, ſecond, third, and fourth pair of the os ſacrum, compoſe the nerve called iſchiatic, which is the largeſt in the body, being marked 3, 3, in fig. 2. it deſcends along the hinder part of the thigh, and its branches are diſtributed over the whole leg, the foot and toes; being marked 15, 17, 18, &c.

The nerves of the ſacrum form five or ſix pair, though not always determinately and regularly ſo: they paſs through the foramina of this bone, and the ſuperior ones of them, as already obſerved, compoſe the iſchiatic nerve; and what remains is diſperſed, in a multitude of ramifications, over the parts contained in the pelvis, the inteſtinum rectum, the bladder, the parts of generation, and the parts adjacent. They are marked, in the figure, Λ, Ξ, Π, Σ, &c.

We ſhall only add, that 1, 1, fig. 2. repreſent the brachial nerves; 2, 2, &c. the communications of the vertebral nerves with the intercoſtals; *l*, *l*, remarkable communications between the phrenic nerves and the intercoſtals; *t*, *u*, *u*, &c. the acceſſory nerve of the eighth pair; *x*, *x*, the phrenic nerves; and *z*, *z*, the nerves which go to the teſtes, uterus, &c.

Wounds of the NERVES. Upon the diviſion of a nerve, Heiſter obſerves, that the limb to which that nerve was extended becomes inſtantly rigid, void of ſenſation, and withers: ſo that it is no wonder that a man inſtantly expires, upon the diviſion of thoſe nerves which are ſent to the heart or diaphragm: a wound is alſo attended with great danger where the nerve is only partially wounded, and not entirely divided; for the wounded fibres contract themſelves, and thoſe which remain undivided ſuffer too great an extenſion, which will bring on moſt violent pains, ſpaſms, convulſions, inflammations, and gangrenes, and ſometimes death itſelf.

Conſent of the NERVOUS *parts.* See the article CONSENT.

NEST, *nidus.* See the article NIDUS.

NESTORIANS, a chriſtian ſect, the followers of Neſtorius, biſhop and patriarch of Conſtantinople; who, about the year 429, taught that there were two perſons in Jeſus Chriſt, the divine and the human, which are united, not hypoſtatically or ſubſtantially, but in a myſtical manner: whence he concluded, that Mary was the mother of Chriſt and not the mother of God. For this opinion, Neſtorius was condemned and depoſed by the council of Epheſus; and the decree of this council was confirmed by the emperor Theodoſius, who baniſhed the biſhop to a monaſtery.

Thoſe chriſtians who at this day are called neſtorians and chaldeans, are very numerous, and are ſpread over Meſopotamia, and along the river Tigris and Euphrates: they are even got into the Indies, and into Tartary and China. Thoſe of India ſettled there under a neſtorian prieſt called John, who, in the year 1145, got himſelf declared king of Indoſtan, and grew very famous under the name of Preſter John. The neſtorians, though they ſpeak the language of the reſpective countries, only officiate in the chaldee or ſyriac tongue. The neſtorian monks are habited in a black gown tied with a leathern girdle, and wear a blue turban. The nuns are dreſſed much after the ſame manner, excepting that they tie a kind of black veil about their heads and about their chins. They muſt be forty years old before they take the monaſtic habit.

NET, a device for catching fiſh and fowl. See the article FISHERY.

The taking fowls by nets, is the readieſt and moſt advantageous of all others, where numbers are to be taken. The making the nets is very eaſy, and what every true ſportſman ought to be able to do for himſelf. All the neceſſary tools are wooden needles, of which there ſhould be ſeveral of different ſizes, ſome round and others flat: a pair of round-pointed and flat ſciſſars, and a wheel to wind

wind off the thread. The packthread is to be of different ſtrength and thickneſs, according to the ſort of birds to be taken; and the general ſize of the meſhes, if not for very ſmall birds, is two inches from point to point. The nets ſhould neither be made too deep nor too long, for they are then difficult to manage; and they muſt be verged on each ſide with twiſted thread. The natural colour of the thread is too bright and pale, and is therefore in many caſes to be altered. The moſt uſual colour is the ruſſet, which is to be obtained by plunging the net after it is made, into a tanner's pit, and letting it lie there till it be ſufficiently tinged: this is of a double ſervice to the net, ſince it preſerves the thread as well as alters the colour. The green colour is given by chopping ſome green wheat and boiling it in water, and then ſoaking the net in this green tincture. The yellow colour is given in the ſame manner with the decoction of celandine, which gives a pale ſtraw-colour, which is the colour of ſtubble in the harveſt-time. The brown nets are to be uſed on ploughed lands, the green on graſs grounds, and the yellow on ſtubble lands.

NETE DIEZEUGMENON, in the antient muſic, one of the chords of the greek ſyſtem, anſwering to the *E ſi mi* of the third octave of the modern. See the article DIAGRAM.

NETE HYPERBOLÆON, in antient muſic, the higheſt or moſt acute of the chords of the antient diagram, anſwering to the *A mi la* of the third octave of the organ.

NETE SYNEMMENON, in antient muſic, the higheſt chord of a tetrachord, or fourth, of the greek ſyſtem, added to make B flat fall between the *meſe* and *parameſe*, or our A and B, which till then had the interval of a tone-major between them. This chord has the ſame ſound with the paranete diezeugmenon, or our D by B flat. See DIAGRAM.

NETHERLANDS, antiently called Belgia, but ſince denominated Low-Countries, or Netherlands, from their low ſituation, are ſituated between 2 and 7° of eaſt longitude, and between 50 and 53° 30′ of north latitude; and are bounded by the german-ſea on the north; Germany on the eaſt; by Lorrain and France on the ſouth; and by another part of France and the britiſh ſeas on the weſt; extending near three hundred miles in length from north to ſouth, and two hundred miles in breadth from eaſt to weſt. They conſiſt of ſeventeen provinces; ten of which are called the auſtrian and french Netherlands, and the other ſeven United-Provinces.

NETTINGS, in a ſhip, a ſort of grates made of ſmall ropes, ſeized together with rope-yarn or twine, and fixed on the quarters and in the tops; they are ſometimes ſtretched upon the ledges from the waſte-trees to the roof-trees, from the top of the fore-caſtle to the poop; and ſometimes are laid in the waſte of a ſhip to ſerve inſtead of gratings.

NETTLE, *urtica*, in botany. See the article URTICA.

The root of the common-nettle is accounted diuretic and lithontriptic: it ſerves alſo to purify the blood, and is good in ſpittings of blood, hæmorrhages, and the menſes. The ſeeds of the roman-nettle are recommended in the aſthma, and other diſorders of the lungs.

Dead NETTLE. See LAMIUM.

NETTLE-TREE, *celtis*. See CELTIS.

NETTUNO, a port-town of Italy, in the Compagna di Roma; ſituated on the Mediterranean, thirty miles ſouth-eaſt of Rome.

NEUENSTAT, a town of Germany, twelve miles north-eaſt of Hailbron.

NEVERS, a city of France, capital of the Nivernois: eaſt long. 3° 15′, north lat. 46° 50′.

NEUFCHATTEAU, a town of Luxemburg, twenty miles north-eaſt of Sedan.

NEUFCHATTEL, the capital of the counties of Neufchattel and Vallengin, in Switzerland, which together form one free and independent ſtate, ſubject to the king of Pruſſia: eaſt long. 6° 35′, noth lat. 47° 10′.

NEUFCHATTEL is alſo a town of Normandy, in France, twenty-three miles north-eaſt of Rouen.

NEVIN, or NEWIN, a market-town of North-Wales, eighteen miles ſouth-weſt of Caernarvon.

NEVIS, one of the Caribbee-iſlands, divided from the eaſt end of St. Chriſtophers by a narrow channel.

NEURADA, in botany, a genus of the decandria-monogynia claſs of plants, the flower of which conſiſts of five equal petals, and its fruit is an orbiculated depreſſed capſule, convex on the under-part, and every where armed with aſcendent prickles: it contains ten cells, in each of which is a ſingle ſeed.

NEU-

NEURITICS, in pharmacy, medicines good in diſorders of the nerves.

NEUROGRAPHY, ſignifies a deſcription of the nerves, as neurology does a diſcourſe concerning them. See NERVES.

NEUROPTERA, in the hiſtory of inſects, a name given to that claſs of inſects, which have membranaceous wings, with nerves and veins diſpoſed in a reticulated form in them.

NEUSTAT, a city of Germany, thirty miles ſouth of Vienna.

NEUSTAT is alſo a town of lower-Saxony, ſixteen miles north-weſt of the city of Hanover.

NEUTER, or NEUTER-GENDER, in grammar, one of the three genders of nouns, ſo called as being neither maſculine nor feminine. See the article GENDER.

NEUTER-VERBS. See the article VERB.

NEUTRAL SALTS, among chemiſts, a ſort or ſalts neither acid nor alkaline, but partaking of the nature of both. See the articles ACID and ALKALI.

The principal ſalts of this kind, are common-ſalt, nitre, aphronitre, the eſſential ſalts of plants, and thoſe obtained, by boiling, from ſome medicinal waters. Such temperate and neutral ſalts, are both ſafeſt and moſt efficacious in curing many of the diſorders incident to mankind. They are known by making no degree of effervescence, either with acids or alkalies, but become quite ſaturated upon the affuſion of ſuch liquors.

NEUTRALITY, the ſtate of a perſon or thing that is neuter, or that takes part with neither ſide.

NEW-MOON, *neomenia*, ſtrictly ſpeaking, is the ſtate of the moon a little after her conjunction with the ſun; though it is often uſed for the conjunction itſelf. See the articles MOON and NEOMENIA.

NEWARK, a borough-town of Nottinghamſhire, fifteen miles north eaſt of Nottingham.

It ſends two members to parliament.

NEWBOROUGH, a market-town of Angleſey, fifteen miles north-weſt of Beaumaris.

NEWBURG, a city of Bavaria, in Germany, twenty-eight miles north-eaſt of Augſburg.

NEWBURG is alſo the name of two other towns of Germany; one in Swabia, twenty-five miles weſt of Stutgart; and the other, likewiſe in Swabia, twelve miles north of Baſil.

NEWBURY, a market-town of Berkſhire, fifteen miles weſt of Reading.

NEWCASTLE, the county-town of Northumberland, ſituated on the river Tine: weſt long. 1° 10′, north lat. 55°.

It ſends two members to parliament.

NEWCASTLE, a borough-town of Staffordſhire, ten miles north of Stafford.

It ſends two members to parliament.

NEWCASTLE, a market-town of Carmarthenſhire, in South-Wales, fifteen miles north of Carmarthen.

NEWEL, in architecture, is the upright poſt which a pair of winding-ſtairs turn about: this is properly a cylinder of ſtone which bears on the ground, and is formed by the end of the ſteps of the winding-ſtairs. There are alſo newels of wood, which are pieces of timber placed perpendicularly, receiving the tenants of the ſteps of the wooden-ſtairs into their mortices, and on which are fitted the ſhafts and reſts of the ſtair-caſe, and the flights of each ſtory.

NEWFIDLERS SEA, a lake thirty-five miles long, on the north-weſt part of Upper Hungary.

NEW-FOREST, a part of Hampſhire, oppoſite to the Iſle of Wight, appropriated by act of parliament for the growth of oaks to build the royal navy. See the article FOREST.

NEWFOUNDLAND, a triangular iſland, three hundred and fifty miles in length from north to ſouth, and two hundred miles in breadth at the baſe, from eaſt to weſt; ſituated in North-America, between 55 and 61° of weſt longitude, and between 47 and 52° of north latitude; bounded by the narrow ſtreights of Beliſle on the north; by the Atlantic-ocean on the eaſt and ſouth; and by the bay of St. Lawrence on the weſt. It is ſubject to England; but the fiſhing-banks on this coaſt are frequented by moſt european nations.

NEW ENGLAND. See ENGLAND.

NEWHAUSEL, a city of Upper Hungary, ſituated on the river Neytra: eaſt long. 18° 12′, north lat. 48° 25′.

NEWMARK, a city of Tranſilvania, ſubject to the houſe of Auſtria: eaſt long. 23° 25′, north lat. 47° 35′.

NEWMARK is alſo a town of Germany in the palatinate of Bavaria, thirty miles north-weſt of Ratiſbon.

NEWMARKET, a market-town, ſituated both in Cambridgeſhire and Suffolk, twelve miles eaſt of Cambridge.

NEWN-

NEWNHAM, a market-town, ten miles ſouth-weſt of Gloceſter.

NEWPORT, a port-town of Flanders, nine miles ſouth-weſt of Oſtend.

NEWPORT is alſo a borough town of the Iſle of Wight, which ſends two members to parliament.

NEWPORT is alſo a borough of Cornwal, ten miles weſt of Launceſton, which ſends two members to parliament.

NEWPORT is alſo the name of ſeveral market-towns; one fifteen miles eaſt of Shrewſbury; another eighteen miles ſouth-weſt of Monmouth; and a third ſixteen miles north-eaſt of St. Davids.

NEWPORT-PAGNEL, a market-town, ſixteen miles north of Ailſbury.

NEWSTAT, the name of ſeveral towns; one eight miles north of Landau; another fifteen miles ſouth-weſt of Ratiſbon; a third in Sileſia, fifteen miles ſouth of Breſlaw; a fourth in Hungary, ſixty-five miles eaſt of Tockay; and a fifth in Moravia, ten miles north of Olmutz.

NEWT, or EFT, in zoology. See the articles EFT and LIZARD.

NEWTON, a borough-town, thirty-five miles ſouth of Lancaſter.

It ſends two members to parliament.

NEWTON is alſo a borough town in the Iſle of Wight, twelve miles ſouth of Southampton: it ſends two members to parliament.

NEWTONIAN-PHILOSOPHY, the doctrine of the univerſe, and particularly of the heavenly bodies; their laws, affections, &c. as delivered by Sir Iſaac Newton.

The term Newtonian philoſophy is applied very differently by different authors. Some, under this philoſophy, include all the corpuſcular philoſophy, conſidered as it now ſtands corrected and reformed by the diſcoveries and improvements made in the ſeveral parts there f by Sir Iſaac Newton. In this ſenſe it is that 's Graveſande calls his Elements of Phyſics, an Introduction to the Newtonian philoſophy; and in this ſenſe, the newtonian is the ſame with the new philoſophy, in oppoſition to the carteſian, the peripatetic, and the antient corpuſcular philoſophy. See CARTESIAN, &c.

Others, by newtonian philoſophy, mean the method or order which Sir Iſaac obſerves in philoſophizing, *viz.* the reaſoning and drawing of concluſions directly from phænomena, excluſive of all previous hypotheſes; the beginning from ſimple principles, deducing the firſt powers and laws of nature from a few ſelect phænomena, and then applying thoſe laws, &c. to account for other things: and in this ſenſe, the newtonian is the ſame with the experimental philoſophy. See the article EXPERIMENTAL.

Others again, by newtonian philoſophy, mean that wherein phyſical bodies are conſidered mathematically, and where geometry and mechanics are applied to the ſolution of phænomena; in which ſenſe, the newtonian is the ſame with the mechanical and mathematical philoſophy. See the article MECHANICAL.

Others again, by newtonian philoſophy, underſtand that part of phyſical knowledge which Sir Iſaac Newton has handled, improved, and demonſtrated in his Principia.

And, laſtly, others, by newtonian philoſophy, mean the new principles which Sir Iſaac has brought into philoſophy, the new ſyſtem founded thereon, and the new ſolutions of phænomena thence deduced; or that which characterizes and diſtinguiſhes his philoſophy from all others: and this is the ſenſe, in which we ſhall chiefly conſider it.

As to the hiſtory of this philoſophy, we have but little to ſay: it was firſt made public in 1686, by the author, then a fellow of Trinity-college, Cambridge; and in the year 1713, republiſhed with conſiderable improvements. Several other authors have ſince attempted to make it plainer, by ſetting aſide many of the more ſublime mathematical reſearches, and ſubſtituting either more obvious reaſonings or experiments in lieu thereof; particularly Mr. Whiſton, in his Prelect. Phyſ. Mathem. 's Graveſande, in his Elem. and Inſt. and lately, by the learned Comment of Le Seur and Jacquier upon Sir Iſaac's Principia.

The philoſophy itſelf is laid down chiefly in the third book of the Principia; the two preceding books being taken up in preparing the way, and laying down ſuch principles of mathematics as have the moſt relation to philoſophy: ſuch are the laws and conditions of powers; and theſe, to render them leſs dry and geometrical, the author illuſtrates by ſcholia in philoſophy, relating chiefly to the denſity and reſiſtance of bodies, the motion of light and ſounds, a vacuum, &c.

In the third book he proceeds to the philoſophy itſelf; and from the ſame principles deduces the ſtructure of the univerſe, and the powers of gravity, whereby bodies tend towards the ſun and planets; and, from theſe powers, the motions of the planets and comets, the theory of the

moon and the tides. This book, which he calls de Mundi Syſtemate, he tells us, was firſt wrote in the popular way; but conſidering, that ſuch as are unacquainted with the ſaid principles, would not conceive the force of the conſequences, nor be induced to lay aſide their antient prejudices; for this reaſon, and to prevent the thing from being in continual diſpute, he digeſted the ſum of that book into propoſitions, in the mathematical manner, ſo as it might only come to be read by ſuch as had firſt conſidered the principles; not that it is neceſſary a man ſhould maſter them all, many of them even the firſt rate mathematicians would find a difficulty in getting over. It is enough to have read the definitions, laws of motion, and the three firſt ſections of the firſt book; after which, the author himſelf directs us to paſs on to the book De Syſtemate Mundi.

The great principle on which the whole philoſophy is founded, is the power of gravity: this principle is not new; Kepler, long ago, hinted it in his Introduct. ad Mot. Martis. He even diſcovered ſome of the properties thereof, and their effects in the motions of the primary planets; but the glory of bringing it to a phyſical demonſtration, was reſerved to the engliſh philoſopher. See the article GRAVITATION.

His proof of this principle from phænomena, together with the application of the ſame principle to the various other appearances of nature, or the deducing thoſe appearances from that principle, conſtitute the newtonian ſyſtem: which, drawn in miniature, will ſtand thus:

1. The phænomena are, 1. That the ſatellites of jupiter do, by radii drawn to the center of the planet, deſcribe areas proportional to their times; and that their periodical times are in a ſeſquiplicate ratio of their diſtances from its center; in which the obſervations of all aſtronomers agree. 2. The ſame phænomenon holds of the ſatellites of ſaturn, with regard to ſaturn; and of the moon, with regard to the earth. 3. The periodical times of the primary planets about the ſun, are in a ſeſquiplicate ratio of their mean diſtances from the ſun. But, 4. The primary planets do not deſcribe areas any way proportional to their periodical times, about the earth; as being ſometimes ſeen ſtationary, and ſometimes retrograde, with regard thereto. See SATELLITE, PERIOD, &c.

2. The powers whereby the ſatellites of jupiter are conſtantly drawn out of their rectilinear courſe, and retained in their orbits, reſpect the center of jupiter, and are reciprocally as the ſquares of their diſtances from the ſame center. 2. The ſame holds of the ſatellites of ſaturn, with regard to ſaturn; of the moon, with regard to the earth; and of the primary planets, with regard to the ſun. See the article CENTRAL FORCES.

3. The moon gravitates towards the earth, and by the power of that gravity is retained in her orbit: and the ſame holds of the other ſatellites with reſpect to their primary planets; and of the primaries with reſpect to the ſun.

As to the moon, the propoſition is thus proved: the moon's mean diſtance is 60 ſemidiameters of the earth; her period, with regard to the fixed ſtars, is 27 days, 7 hours, 43 minutes; and the earth's circumference 123249600 Paris-feet. Now, ſuppoſing the moon to have loſt all her motion, and to be let drop to the earth, with the power which retains her in her orbit, in the ſpace of one minute ſhe will fall $15\frac{1}{12}$ Paris-feet; the arch ſhe deſcribes in her mean motion, at the diſtance of 60 diameters of the earth, being the verſed ſign of $15\frac{1}{12}$ Paris-feet. Hence, as the power, as it approaches the earth, increaſes in a duplicate ratio of the diſtance inverſely; ſo as at the ſurface of the earth it is 60×60 greater than at the moon; a body falling with that force in our region muſt, in a minute's time, deſcribe the ſpace of $60\times60\times15\frac{1}{12}$ Paris-feet, and $15\frac{1}{12}$ Paris-feet in the ſpace of one ſecond. But this is the rate at which bodies fall by their gravity at the ſurface of our earth; as Huygens has demonſtrated by experiments with pendulums. Conſequently, the power whereby the moon is retained in her orbit, is the very ſame we call gravity; for, if they were different, a body, falling with both powers together, would deſcend with double the velocity, and in a ſecond of time deſcribe $30\frac{1}{6}$ feet. See DESCENT and MOON.

As to the other ſecondary planets, their phænomena, with reſpect to their primary ones, being of the ſame kind with thoſe of the moon about the earth, it is argued by analogy, they depend on the ſame cauſes; it being a rule or axiom all philoſophers agree to, that effects of the ſame kind have the ſame cauſes. Again, attraction

traction is always mutual, *i. e.* the reaction is equal to the action: conſequently the primary planets gravitate towards their ſecondary ones, the earth towards the moon, and the ſun towards them all. And this gravity, with regard to each ſeveral planet, is reciprocally as the ſquare of its diſtance from the center of gravity. See ATTRACTION, *&c.*

4. All bodies gravitate towards all the planets; and their weight towards any one planet, at equal diſtances from the center of the planet, is proportional to the quantity of matter in each. See the article WRIGHT.

For the law of the deſcent of heavy bodies towards the earth, ſetting aſide their unequal retardation from the reſiſtance of the air, is this, that all bodies fall equal ſpaces in equal times; but the nature of gravity or weight, no doubt, is the ſame on the other planets as on the earth.

Suppoſe, *e. gr.* ſuch bodies raiſed to the ſurface of the moon, and together with the moon deprived at once of all progreſſive motion, and dropped towards the earth: it is ſhewn, that in equal times they will deſcribe equal ſpaces with the moon; and therefore, that their quantity of matter is to that of the moon, as their weights to its weight.

Add, that ſince jupiter's ſatellites revolve in times that are in a ſeſquiplicate ratio of their diſtances from the center of jupiter, and conſequently at equal diſtances from jupiter, their accelerating gravities are equal; therefore, falling equal altitudes in equal times, they will deſcribe equal ſpaces; juſt as in heavy bodies on our earth. And the ſame argument will hold of the primary planets with regard to the ſun, and the powers whereby unequal bodies are equally accelerated, are as the bodies, *i. e.* the weights are as the quantities of matter in the planets, and the weight of the primary and ſecondary planets towards the ſun, are as the quantities of matter in the planets and ſatellites. See the article JUPITER.

And hence are ſeveral corollaries drawn relating to the weights of bodies on the ſurface of the earth, magnetiſm, and the exiſtence of a vacuum. See the articles WEIGHT and MAGNET.

5. Gravity extends itſelf towards all bodies, and is in proportion to the quantity of matter in each.

That all planets gravitate towards each other, has been already ſhewn; likewiſe, that the gravity towards any one, conſidered apart, is reciprocally as the ſquares of its diſtance from the center of the planet; conſequently, gravity is proportionable to the matter therein. Further, as all the parts of any planet, A, gravitate towards another planet B; and the gravity of any part is to the gravity of the whole, as the matter of the part to the matter of the whole; and reaction equal to action: the planet B will gravitate towards all the parts of the planet A; and its gravity towards any part will be to its gravity towards the whole, as the matter of the part to the matter of the whole. Hence we derive the methods of finding and comparing weights of bodies towards different planets; of finding the quantity of matter in the ſeveral planets, and their denſities; ſince the weights of equal bodies, revolving about planets, are as the diameter of their orbits directly, and as the ſquares of the periodical times inverſely; and the weights at any diſtance from the center of the planet are greater or leſs in a duplicate ratio of their diſtances inverſely. And ſince the quantities of matter in the planets are as their powers at equal diſtances from their centers: and laſtly, ſince the weights of equal and homogeneous bodies towards homogeneous ſpheres are, at the ſurfaces of the ſpheres, as the diameters of thoſe ſpheres; and conſequently, the denſities of heterogeneous bodies are as the weights at the diameters of the ſpheres.

6. The common center of gravity of the ſun, and all the planets is at reſt; and the ſun, though always in motion, yet never recedes far from the common center of all the planets.

For the matter in the ſun being to that in jupiter as 1033 to 1; and jupiter's diſtance from the ſun to the ſemidiameter of the ſun in a ratio ſomewhat bigger; the common center of gravity of jupiter and the ſun will be a point a little without the ſun's ſurface; and by the ſame means, the common center of ſaturn and the ſun will be a point a little within the ſun's ſurface; and the common center of the earth, and all the planets, will be ſcarce one diameter of the ſun diſtant from the center thereof: but the center is always at reſt; therefore, though the ſun will have a motion this and that way, according to the various ſituations of the planets, yet it can never recede far from

the center; ſo that the common center of gravity of the earth, ſun, and planets, may be eſteemed the center of the whole world. See the article PLANET.

7. The planets move in ellipſes that have their foci in the center of the ſun, and deſcribe areas proportionable to their times. This we have already laid down à poſteriori, as a phænomenon; and now that the principle of the heavenly motions is ſhewn, we deduce it therefrom à priori. Thus, ſince the weights of the planets towards the ſun are reciprocally as the ſquares of their diſtances from the center of the ſun; if the ſun were at reſt, and the other planets did not act on each other, their orbits would be elliptical, having the ſun in the common umbilicus, and would deſcribe areas proportionable to the times; but the mutual actions of the planets are very ſmall, and may be well thrown aſide. See the article ORBIT.

Indeed the action of jupiter on ſaturn is of ſome conſequence; and hence, according to the different ſituation and diſtances of thoſe two planets, their orbits will be a little diſturbed. The earth's orbit too is ſenſibly diſturbed by the action of the moon; and the common center of the two deſcribes an ellipſis round the ſun placed in the umbilicus; and, with a radius drawn to the center of the ſun, deſcribes areas proportionable to the times. See the article EARTH, &c.

8. The aphelia and nodes of the planets are at reſt, excepting for ſome inconſiderable irregularities ariſing from the action of the revolving planets, and comets. Conſequently, as the fixed ſtars retain their poſition to the aphelia and nodes, they too are at reſt. See the article NODES, &c.

9. The axis, or polar diameter, of the planets is leſs than the equatorial diameter.

The planets, had they no diurnal rotation, would be ſpheres, as having an equal gravity on every ſide: but by this rotation the parts receding from the axis endeavour to riſe towards the equator, which, if the matter they conſiſt of be fluid, will be affected very ſenſibly. Accordingly, jupiter, whoſe denſity is found not much to exceed that of water on our globe, is obſerved by aſtronomers to be conſiderably leſs between the two poles than from eaſt to weſt. And, on the ſame principle, unleſs our earth were higher at the equator than towards the poles, the ſea would riſe under the equator, and overflow all near it. But this figure of the earth Sir Iſaac Newton proves likewiſe à poſteriori, from the oſcillations of pendulums being ſlower and ſmaller in the equinoctial, than in the polar parts of the globe. See the article EARTH.

10. All the moon's motions, and all the inequalities of theſe motions, follow from theſe principles, *e. gr.* her unequal velocity, and that of her nodes and apogee in the ſyzygies and quadratures; the differences in her eccentricity and her variation. See the article MOON.

11. From the inequalities of the lunar motions, we can deduce the ſeveral inequalities in the motions of the ſatellites.

12. From theſe principles, particularly the action of the ſun and moon upon the earth, it follows, that we muſt have tides, or that the ſea muſt ſwell and ſubſide twice every day. See TIDES.

13. Hence, likewiſe, follows the whole theory of comets, as that they are above the region of the moon, and in the planetary ſpaces; that they ſhine by the ſun's light, reflected from them; that they move in conic ſections, whoſe umbilici are in the center of the ſun; and, by radii drawn to the ſun, deſcribe area's proportional to the times; that the orbits or trajectories are very nearly parabola's; that their bodies are ſolid, compact, &c. like thoſe of the planets, and muſt therefore acquire an immenſe heat in their perihelia; that their tails are exhalations ariſing from and encompaſing them like atmoſpheres. See the article COMET.

NEYLAND, a market-town of Suffolk, fourteen miles ſouth-weſt of Ipſwich.

NIAGARA, a prodigious cataract in Canada, in North America, between the lakes Erie and Ontario, where the water falls from high rocks 156 feet perpendicular. The miſt which this fall occaſions may be ſeen at fifteen miles diſtance riſing as high as the clouds, and forming a beautiful rainbow.

NIBANO, a town of Italy, in the dutchy of Parma, thirty-five miles weſt of Parma.

NICARAGUA, a province of Mexico, bounded by the province of Honduras, on the north; by the North-ſea on the eaſt; by the province of Coſtarica, on the ſouth-eaſt; and by the South-ſea, on the ſouth-weſt; being 400 miles long, and 120 broad. Nicaragua-lake runs through the middle of the province.

NICARIA, one of the iſlands of the Archipelago,

chipelago, in Aſiatic Turky: eaſt lon. 26° 5′ north lat. 37°.

NICASTRO, a town of Naples, in the territory of Calabria: eaſt long. 16° 40′, north lat. 39° 15′.

NICE, the capital of the county of the ſame name, ſituated on the Mediterranean, at the mouth of the river Var: eaſt long. 7° 15′, north lat. 43° 40′.

NICE is alſo a town of Aſiatic Turky, fifty miles ſouth-eaſt of Conſtantinople.

NICHE, in architecture, a hollow ſunk into a wall, for the commodious and agreeable placing a ſtatue.

The ordinary proportion of a niche is to have two circles in height and one in width; but M. Le Clerc makes their height ſomething more, the exceſs being to compenſate for the height of the pedeſtal of the ſtatue. The hollow is ſemicircular at bottom, that is, in its plan; and at top it terminates in a kind of canopy. Niches have frequently an impoſt, and an archivolt or head-band, and the canopy wrought and enriched in the manner of a ſhell. The breadth of the archivolt may be made equal to a ſixth or ſeventh part of the niche, and the height of the impoſt to a fifth or ſixth part of the ſame: and the impoſt and archivolt ought to conſiſt of ſuch mouldings as have ſome relation to the architecture of the place. Niches are ſometimes made with ruſtic-work, ſometimes with ſhell-work, and ſometimes of cradle or arbour-work. Niches are ſometimes made ſquare, but theſe want all the beauty of the others.

NICHED COLUMN. See COLUMN.

NICHILS, or NIHILS, in law. See the article NIHILS.

NICOBAR-ISLANDS, a cluſter of iſlands ſituated in the Indian-ocean, at the entrance of the gulph of Bengal, between 7° and 10° north lat.

NICOLAITANS, in church-hiſtory, chriſtian heretics who aſſumed this name from Nicolas of Antioch; who, being a gentile by birth, firſt embraced judaiſm, and then chriſtianity; when his zeal and devotion recommended him to the church of Jeruſalem, by whom he was choſen one of the firſt deacons. Many of the primitive writers believe that Nicolas was rather the occaſion than the author of the infamous practices of thoſe who aſſumed his name, who were expreſsly condemned by the ſpirit of God himſelf, Apoc. ii. 6. And indeed their opinions and actions were highly extravagant and criminal. They allowed a community of wives: made no difference between ordinary meats and thoſe offered to idols: and told I know not what fables of the creation and diſpoſition of the world. According to Euſebius, they ſubſiſted but a ſhort time; but Tertullian ſays, that they only changed their name, and that their hereſies paſſed into the ſect of the cainians. See CAINIANS.

St. NICOLAS, a town of Lorrain, ten miles ſouth-eaſt of Nancy, at the mouth of the river Dwina.

St. NICOLAS is alſo a port-town of Ruſſia ſituated on the White-ſea, ſix miles below Archangel.

St. NICOLAS'S DAY, a feſtival of the romiſh church, obſerved on the 6th of December.

NICOMEDIA, a city of Aſiatic Turky, thirty miles ſouth-eaſt of Conſtantinople.

NICOPOLIS, a city of European Turky, ſituated on the Danube, 100 miles north-weſt of Adrianople: eaſt long. 25°, north lat. 43°.

NICOPPING, a city of Sweden, in the province of Sunderland, fifty miles ſouth of Stockholm.

NICOPPING is alſo the capital of the iſland Hulſter, ſubject to Denmark, and forty-eight miles ſouth weſt of Copenhagen.

NICOSIA, the capital of the iſland of Cyprus: eaſt long. 35°, north lat. 35°.

NICOTERA, a port-town of the kingdom of Naples, thirty miles north-eaſt of Reggio.

NICOTIANA, in botany, a plant more commonly known by the name of tobacco. See the article TOBACCO.

NICOYA, or *St.* LUCAR, a port-town of Mexico, ſituated on a bay of the South-ſea, in 88° weſt longitude, and 10° 15′ north latitude.

NICTITATING MEMBRANE, in comparative anatomy, a thin membrane, chiefly found in the bird and fiſh-kind, which covers the eyes of theſe animals, ſheltering them from the duſt or too much light; yet is ſo thin and pellucid, that they can ſee pretty well through it.

NIDUS, among naturaliſts, ſignifies a neſt, or proper repoſitory for the eggs of birds, inſects, &c. wherein the young of theſe animals are hatched and nurſed.

NIECE, a brother or ſiſter's daughter, which in the civil law is reckoned the third degree of conſanguinity.

NIEMEN, or BEREZINA, a river of Poland, which riſes in Lithuania, and falls into a bay of the Baltic-ſea, near Memel.

NIENHUIS, a town of Germany, in the circle of Weſtphalia: eaſt long. 8° 25′, north lat. 51° 40′.

NIENT COMPRISE, in law, an exception taken to a petition as unjuſt, becauſe the thing deſired is not in the deed on which the petition is founded. Thus on a perſon's deſiring the court to be put in poſſeſſion of a houſe, formerly adjudged to him among other lands, the adverſe party pleads that the petition ought not to be granted; becauſe though the petitioner had a judgment for certain lands and houſes, yet that houſe is nient compriſe, not compriſed therein.

NIEPER, or BORISTHENES, a river which riſes in the middle of Ruſſia, and running ſouth through Poland, enters the ruſſian Ukrain, ſeparates Little Tartary from Budziac Tartary, and falls into the Black-ſea, near Oczakow.

NIESTAT, a town of Lower Saxony, in the dutchy of Mecklenburg: eaſt long. 11° 26′, north lat. 53° 40′.

NIESTAT is alſo a town of Upper Saxony, in the marquiſate of Brandenburg, 25 miles north-eaſt of Berlin.

NIESTER, a river which riſes in Poland, and running ſouth-eaſt divides Podolia in Poland, from Moldavia in Turky, and afterwards dividing Beſſarabia from Budziac Tartary, falls into the Black-ſea near Belgorod.

NIGELLA, in botany, a genus of the polyandria pentagynia claſs of plants; the corolla whereof conſiſts of five plane, oval, obtuſe, patent petals, narroweſt towards the baſe; the fruit conſiſts of as many capſules, as there were germina, which in ſome ſpecies are five, and in others ten, theſe capſules are oblong, compreſſed, acuminated, joined by an internal ſuture, and open upwards, and inwards; the ſeeds are numerous angular and rough.

NIGER, a great river of Africa, which runs from eaſt to weſt through the middle of Negroland, and diſcharges itſelf into the Atlantic ocean by three channels, called Rio Grande, Gambia, and the river Senega. It is 300 miles between the northern and ſouthern channels, and all the country between them is annually overflowed, as Egypt is by the Nile.

NIGHT, that part of the natural day during which the ſun is underneath the horizon; or that ſpace wherein it is duſky. See the article DAY.

Night was originally divided by the Hebrews, and other eaſtern nations, into three parts, or watchings. The Romans, and afterwards the Jews from them, divided the night into four parts, or watches, the firſt of which began at ſun-ſet and laſted till nine at night, according to our way of reckoning; the ſecond laſted till midnight; the third till three in the morning; and the fourth ended at ſun-riſe. The antient Gauls and Germans divided their time not by days but by nights; and the people of Iceland and the Arabs do the ſame at this day. The like is alſo obſerved of our ſaxon anceſtors.

NIGHT-MARE, in medicine, a diſeaſe called by phyſicians ephialtes and incubus. See the article INCUBUS.

NIGHT WALKERS, *Noctambuli*. See the article NOCTAMBULI.

NIGHTINGALE, *luſcinia*, in ornithology, the browniſh-grey motacilla, with the annules of the knees grey. See the article MOTACILLA.

This bird is more eminent for the ſweetneſs of its note, than for its beauty; it is of the ſize of the linnet, but in ſhape it more reſembles the red-breaſt; the head is ſmall, the eyes are large, and their iris pale; the beak is duſky, ſlender, and moderately long; the head, neck and back are of a greyiſh-brown; the upper parts of the wings, and about the tail, have a tinge of reddiſh mixt with this; and the throat, breaſt and belly are of a pale whitiſh grey.

NIGRITIA, or NEGROLAND. See the article NEGROLAND.

NIHIL CAPIAT PER BREVE, or PER BILLAM, in law, the judgment given againſt the plaintiff in an action either in bar thereof, or in abatement of the writ.

NIHIL DICIT, a failure in the defendant to put in an anſwer to the plaintiff's declaration, *&c.* by the day aſſigned for that purpoſe, by which omiſſion judgment of courſe is had againſt him.

NIHIL DEBET, is the uſual plea in an action of debt: but it is no plea in an action of covenant, in a breach aſſigned for nonpayment of rent, *&c.*

NIHIL HABUIT IN TENEMENTIS, a plea that can be pleaded only in an action of debt brought by a leſſor againſt a leſſee without deed; for if it be by indenture of leaſe it may not be pleaded, the leaſe being an eſtoppel: yet it is ſaid, that if it be upon a deed poll, the defendant may plead this plea.

NIHILS, or NICHILS, iſſues which a ſheriff who

who is appoſed in the exchequer ſays are nothing worth, and not to be levied, thro' the inſufficiency of the parties from whom the ſame are due.

NILE, a great river in Egypt, having its ſource in Abyſſinia, or the Upper Ethiopia, in 12° north lat. It generally runs from ſouth to north through Abyſſinia into Egypt, and then continues its courſe north in one ſtream till it comes below Cairo to the Delta, where it divides; one branch diſcharging itſelf into the Mediterranean at Damieta, and another a hundred miles to the weſtward of it at Roſetta. There are great rejoicings every year when the Nile riſes to a certain height, their future harveſt depending upon it. The inſtrument uſed by the antients to meaſure the height of the water of the Nile in its overflowings, was called nilometer. The juſt height of the inundation, according to Pliny, is ſixteen cubits; when it ariſes but to twelve or thirteen, a famine is dreaded; and when it exceeds ſixteen, there is alſo danger apprehended. The river begins uſually to riſe in May or June, and is conveyed by reſervoirs, ciſterns, and canals, to the fields and gardens as they want it.

As to the Delta, it is all overflowed.

NIMBUS, in antiquity, a circle obſerved on certain medals, or round the head of ſome emperors, anſwering to the circles of light, drawn around the images of ſaints. The nimbus is ſeen on the medals of Maurice, Phocas, and others, even of the upper empire.

NIMEGUEN, a city of the united Netherlands, ſituated on the river Waal, in the province of Guelderland, 52 miles ſouth-eaſt of Amſterdam.

NIMETULAHITES, a kind of turkiſh monks, ſo called from their founder Nimetulahi, famous for his doctrines and the auſterity of his life. They aſſemble once a week to ſing hymns in praiſe of God. The candidates for this order are obliged to continue forty days ſhut up in a chamber, where their daily allowance is but four ounces of food; and no body is permitted to viſit them. At the end of this faſt the other religious take the novice by the hand and perform a kind of dance, in which they uſe ſeveral extravagant geſtures; during which exerciſe the novice commonly falls down in a trance, at which time they ſay he receives ſome extraordinary revelation.

NIMPO, a city and port-town of China, in the province of Chekiam: eaſt long. 122°, north lat. 30°.

NINEVEH, an antient city of Aſſyria, was ſituated on the eaſtern banks of the river Tygris, oppoſite to the place where Mouſſul now ſtands.

NINOVE, a town of the auſtrian Netherlands, in the province of Flanders, ſituated on the river Dender, thirteen miles weſt of Bruſſels.

NIO, a ſmall turkiſh iſland in the Archipelago, ſituated north-weſt of Santorini, remarkable for little but the tomb of Homer, who is ſaid to lie buried here.

NIORT, a town of France, in the province of Orleanois and territory of Poictou, ſituated on the river Seure, twenty-eight miles north-eaſt of Rochelle.

NIPHON, the largeſt of the japan iſlands, ſituated in the Indian ocean about 150 miles eaſt of China; being 600 miles long, and 150 broad, and containing 55 provinces.

NIPPERS, in the manege, are four teeth in the fore-part of a horſe's mouth, two in the upper and two in the lower jaw. A horſe puts them forth between the ſecond and third year. See TOOTH.

NIPPERS is alſo an inſtrument in uſe among ſmiths and farriers; being a kind of pincers wherewith, in ſhoeing a horſe, they cut the nails before they rivet them. It is alſo uſed in taking off a ſhoe.

NIPPERS, in a ſhip, are ſmall ropes about a fathom or two long, with a little truck at one end, and ſometimes only a wale-knot. Their uſe is to help holding off the cable from the main or jeer-capſtan, where the cable is ſo ſlimy, ſo wet, and ſo great, that they cannot ſtrain it, to hold it off with their bare hands.

NIPPLES, *papillæ*, in anatomy. See the article BREASTS.

The nipples of women, in their firſt lying in, are frequently ſo ſmall, and ſunk into their breaſts, that the infant cannot get at them to ſuck its nouriſhment. Heiſter obſerves that the readieſt method in this caſe is to apply an infant ſomewhat older, and which can draw ſtronger; or, if this does not ſucceed, to let a woman who has been practiſed in the art, attempt to ſuck. When theſe do not ſucceed, it is common to have recourſe to a glaſs pipe, and the poorer people in ſome places uſually make a tobacco pipe ſerve the turn. Others apply a ſmall cucurbite made of ivory in the form of a hat, which they ſuck ſtrongly

in

in their mouth. The common ſucking-glaſs is alſo, when properly applied, of very ſignal ſervice. To do this, the ſmall hole at the ſide is to be ſtopped with wax, and the glaſs heated with warm water; or, by holding it before the fire, ſo as to rarify, and in part, expel the air. It is then to be applied to the nipple, which, in this caſe, will not only be pulled out, but will diſcharge a large quantity of milk, ſo as to take down the inflammation and tumor in the breaſt. When the ſucking power of the glaſs is grown weak, the hole at the ſide is to be opened, and the milk poured out; the glaſs is then to be heated again, and, the hole being ſtopped again, is to be a ſecond time applied, and ſo on, till the intention is fully anſwered.

NIPPLE-WORT, *lapſana*, in botany. See the article LAPSANA.

NISI PRIUS, in law, a judicial writ which lies in caſes where the jury being impannelled and returned before the juſtices of the bank, one of the parties requeſts to have ſuch a writ, for the eaſe of the country, in order that the trial may come before the juſtices in the ſame county on their coming thither. Theſe trials by niſi prius are intended for the eaſe of the country, by ſaving the parties, jurors and witneſſes the trouble of coming to Weſtminſter. The purport of a writ of niſi prius is, that the ſheriff is thereby commanded to bring to Weſtminſter the men impanelled, at a certain day before the juſtices, "niſi prius juſticiarii domini regis ad aſſiſas capiendas "venerint;" that is, unleſs the juſtices go before the day into ſuch a county to take aſſizes. See JUSTICES.

NISMES, a fine city of France, in the province of Languedoc: eaſt long. 4° 26′, north lat. 43° 40′.

NISNA, or NISE-NOVOGOROD, the capital of the province of Niſe, or Little Novogorod, in Ruſſia: eaſt long. 45°, north lat. 56°.

NISSA, a city of european Turky, in the province of Servia: eaſt long. 23°, north lat. 43°.

NISSA, or NIZZA, a town of Italy, in the dutchy of Montferrat: eaſt long. 8° 40′, north lat. 44° 45′.

NITHSDALE, a county of Scotland, bounded by Clydeſdale, on the north; by Annandale, on the eaſt; by Solway-frith, on the ſouth; and by Galloway, on the weſt.

NITRACHT, or NYTREA, a town of Hungary, forty miles north-eaſt of Preſburg.

NITRE, or SALT-PETRE, is a ſimple ſalt, which is pellucid, but ſomewhat whitiſh, and in its moſt perfect pieces is in the form of long and ſlender cryſtals, of a priſmatic figure, of an equal thickneſs throughout their whole length, compoſed of ſix planes or ſides, and terminated at the end by a pyramid, which is ſmall and ſhort in proportion to the ſize of the column, but compoſed of the ſame number of planes. Theſe ſprigs vaſtly reſemble the common ſprig cryſtals of the rocks. Nitre is to be choſen in fair, long, and tranſparent cryſtals, and ſuch as when applied to the tongue, affects it with a peculiar kind of coldneſs; ſuch as when ſet on the fire eaſily melts, and on being thrown upon it, blazes very furiouſly, and emits a bright and vivid flame without crackling, and leaves only a very little fixed ſalt on the coals.

Nitre is found immerſed in imperceptible particles in earthy ſubſtances, as the particles of metals in their ores; but ſometimes it is found native and pure, in the form of an efflorescence or ſhapeleſs ſalt, either on its ore or on old walls. The earth from which nitre is made, both in Perſia and the Eaſt-Indies, is a kind of marl, found on the bare cliffs on the ſides of hills expoſed to the northern or eaſtern winds, and never in any other ſituation. The people of thoſe countries collect large quantities of this, and having a large and deep pit, which they line with a hard and tenacious kind of clay, they fill it half full of water, and into this they throw the earth; when this is broken and mouldered to powder they add more water, and ſtirring all well together, they let it ſtand four or five days; after this they open a hole made in one of the ſides of the pit, which lets out all the clear water into a channel of about a foot wide, which is in the ſame manner clayed within, through which it runs into another very wide and ſhallow pit, which is prepared in a level ground, and is ſecured by ſlight walls on all but the north-eaſt ſide, and is open to the ſun at the top; here the water by degrees evaporates, and the ſalt which it had embibed from the earth, cryſtallizes into ſmall, browniſh-white hexaedral, but uſually imperfect cryſtals, which are preſerved; and this is the rough ſaltpetre we receive from the Eaſt Indies. The far greater part of the nitre uſed in the

world is prepared in this manner; tho' there are many other methods of procuring it. In ſeveral of the eaſtern nations, the ruins of old buildings expoſed to the north and eaſt winds, and ſheltered from rain, have their walls covered with an efflorescence of a nitrous ſalt, which they throw into the ſolution of the ſalt from the ore, when it will no longer afford any cryſtals of itſelf, and by this addition it becomes capable of affording a large quantity of additional cryſtals like the firſt. Earths moiſtened or manured with the excrements of animals, as the earths of pigeon-houſes, and the like, all afford more or leſs nitre; and vaſt quantities of this ſalt are annually made in France, by boiling in water the matter of old walls, the old plaſter of ruined buildings, and the earths of ſtables and other places where animals have been fed. Saltpetre is a very profitable branch of commerce in England, and there is no doubt but that great quantities of it might be made; that from the Eaſt-Indies pays, on importation, for every 112 lb. 5s. $8\frac{40}{100}$d. and draws back on exportation, 5s. $2\frac{70}{100}$d. That from France, for every 112 lb. pays, on importation, 11s. $7\frac{65}{100}$d. and draws back, on exportation, 6s. $1\frac{95}{100}$d. and the ſame quantity from all other places pays, on importation, 1s. $11\frac{40}{100}$d. and draws back, on exportation, 1s. $5\frac{75}{100}$d.

Saltpetre is of very great uſe in the manufactures; beſides being the baſis of gunpowder, it is uſed in the making of white glaſs, and is of the ſame uſe as common ſalt in preſerving of foods.

Preparations and uſes of NITRE. Purified nitre is one of the capital remedies in medicine. It cools and thins the blood, and gives it a fine florid colour; and therefore in all inflammatory diſeaſes attended with condenſations of the blood, this ſalt proves excellently cooling and attenuating. It is greatly ſerviceable in pleuriſies, peripneumonies and quinſies, in the ſuppreſſion of urine, and in the ſmall pox.

For the manner of purifying nitre, ſee the article GUNPOWDER.

The other preparations of nitre are Glauber's ſpirit of nitre, the ſweet ſpirit of nitre, vitriolated nitre, and aquafortis. 1. Spirit of nitre is prepared as follows: dry eighteen ounces of nitre, and reduce it to an impalpable powder: put it into a clean retort, and pour upon it ſix ounces of highly rectified oil of vitriol; place the retort immediately in a ſand furnace, and apply a large receiver, luting the juncture with Windſor-loam. Let the fire be gentle at firſt, increaſing it gradually till it riſes to the utmoſt heat a ſand furnace is capable of, then, when no more comes over, let all cool; and pour the liquor out of the receiver into a bottle under a chimney, taking care to avoid the dangerous fumes, and ſtop it cloſe up for uſe. This ſpirit diſſolves ſilver, and moſt of the other metals and ſemi-metals, and even ſtones of all kinds, except ſuch as have cryſtal for their baſis. 2. Sweet ſpirit of nitre is thus prepared: take of rectified ſpirit of wine, one quart; of Glauber's ſpirit of nitre, half a pound; mix them by pouring the ſpirit of nitre on the other, and diſtil the mixture with a gentle heat, as long as what comes off will not raiſe any fermentation with a lixivial ſalt. This is a noble diuretic and carminative. It is given in the ſtone and gravel with great ſucceſs, as alſo in jaundices and dropſies; and it is of great ſervice in reſtoring the appetite when depraved by a mucous flegm. The doſe is from fifteen to thirty drops in wine and water. 3. Vitriolated nitre is thus prepared: diſſolve the cake left after the diſtillation of Glauber's ſpirit of nitre, in hot water, and after filtrating the ſolution through paper, evaporate, that the ſalt may ſhoot. This has much the ſame virtues as tartarum vitriolatum, and is frequently ſold under its name. 4. Aquafortis, for the preparation and uſes of which, ſee the article AQUAFORTIS.

NITRE *of the antients*. See NATRUM.

NIUCHE, a kingdom of chineſian Tartary, north of the province of Liotung.

NIVELLE, a town of the auſtrian Netherlands, and province of Brabant, fourteen miles ſouth of Bruſſels.

NIVERNOIS. See the article NEVERS.

NIXABOUR, or NISABOUR, a city of Perſia, in the province of Choraſſan: eaſt long. 57° 32′, north lat. 35° 40′.

NOAH's ARK, in ſcripture antiquity. See the article ARK.

NOAH's ARK-SHELL, in natural hiſtory, a name given to ſeveral ſpecies of cardia, or heart-ſhells; being of an irregular oblong figure, and variouſly furrowed and ſtriated. See the article CARDIA.

NOBILIARY, in literary hiſtory, a book containing the hiſtory of the noble families of a nation, or province; ſuch are Chorier's Nobiliary of Dauphine,

and Caumartin's Nobiliary of Provence. The Germans are ſaid to be particularly careful of their nobiliaries, in order to keep up the purity of their families.

NOBILISSIMUS, MOST NOBLE, in roman antiquity, a title given to the princes of the imperial family, and which was beſtowed on the Cæſars as early as the reign of Trajan; thus nobilis Cæſar, or N. C. that is nobiliſſimus Cæſar, is found on ſome of the antient medals. Triſtan ſays, that the Cæſars bore the title of nobiliſſimi in all ages, but that the nobiliſſimate became a diſtinct independant dignity in the time of Conſtantine the Great.

NOBILITY, a quality that ennobles, and raiſes a perſon poſſeſſed of it above the rank of a commoner.

The origin of nobility in Europe is by ſome referred to the Goths; who, after they had ſeized a part of Europe, rewarded their captains with titles of honour, to diſtinguiſh them from the common people. In Britain the term nobility is reſtrained to degrees of dignity above knighthood: but every where elſe nobility and gentility are the ſame. The britiſh nobility conſiſts only of five degrees, *viz.* that of a duke, marquis, earl or count, viſcount, and baron, each of which ſee under their proper articles. In Britain theſe titles are only conferred by the king, and that by patent, in virtue of which it becomes hereditary. The privileges of the nobility are very conſiderable, they are all eſteemed the king's hereditary counſellors, and are privileged from all arreſts, unleſs for treaſon, felony, breach of peace, condemnation in parliament, and contempt of the king. They enjoy their ſeats in the houſe of peers by deſcent, and no act of parliament can paſs without their concurrence: they are the ſupreme court of judicature, and even in criminal caſes give their verdict upon their honour, without being put to their oath. In their abſence they are allowed a proxy to vote for them, and in all places of truſt are permitted to conſtitute deputies, by reaſon of the neceſſity the law ſuppoſes them under of attending the king's perſon: but no peer is to go out of the kingdom without the king's leave, and when that is granted, he is to return with the king's writ, or forfeit goods and chattels. See PARLIAMENT, PEER *of the realm*, &c.

NOBLE, a money of account containing ſix ſhillings and eight-pence.

The noble was antiently a real coin ſtruck in the reign of Edward III. and then called the penny of gold; but it was afterwards called a roſe-noble, from its being ſtamped with a roſe: it was current at 6s. 8d.

NOCERA, a town of Italy, in the territory of the pope and dutchy of Spoletto, twenty miles north-eaſt of Spoletto.

NOCERA DE PAGANI, a town of the kingdom of Naples, fifteen miles ſouth of the city of Naples.

Terra NOCERIANA, EARTH OF NOCERA, in the materia medica, a ſpecies of bole, remarkably heavy, of a greyiſh-white colour, of an inſipid taſte, and generally with ſome particles in it which grit between the teeth. See BOLE.

It is much eſteemed, by the Italians, as a remedy for venemous bites, and in fevers; but except its aſtringent quality, little dependence is to be had on the other virtues aſcribed to it.

NOCTAMBULI, or NOCTAMBULONES, or SOMNAMBULI, NIGHTWALKERS, in medicine, a term applied to perſons who have a habit of riſing and walking about in their ſleep. See INCUBUS.

This, according to Junker, is a very remarkable diſtemperature of the imagination, and in different perſons differs greatly in degree. Thoſe who are but moderately affected with it, only repeat their actions of the day, and getting out of their bed go quietly to the places they frequent at other times: but thoſe who are afflicted with it in the moſt violent degree, go up to dangerous places, and do things that would terrify them to think of when awake. Theſe are by ſome called lunatic nightwalkers, becauſe fits are obſerved to return with more frequency and greater violence at the changes of the moon. The only material cauſe that can be aſſigned in this caſe is a plethora, or over-fulneſs of blood; but this is influenced by an immaterial one, that is by the fancy, which is buſily employed in dreams about particular objects.

As to the method of cure, the ſame author obſerves, that the primæ viæ are firſt to be cleared of all their foulneſſes by a ſtrong purge; after this it is proper to bleed in the foot, taking away eight or ten ounces; then powders compoſed of cinnabar, nitre, and crab's eyes, ſhould be taken three or four times a day; and particular regard ſhould be had to the changes of the moon. It will be proper to ſet a veſſel of water by the bedſide, in ſuch a manner that the perſon will naturally

rally ſtep into it on getting out, and be awaked by that means; and if theſe things fail, a perſon ſhould ſit up to watch him, and beat him every time it happens.

NOCTANTUR, in law, a writ that iſſues out of the court of chancery, and is returnable in the king's bench; and lies where a perſon having a right to improve waſte ground, erects a hedge or ditch, which is thrown down in the night-time, and it cannot be known by a jury by whom ſuch damage was done: in that caſe if the neighbouring villages do not find out and indict the offenders, they ſhall be diſtrained to make good the ſame at their own coſts, &c.

NOCTILUCA, in phyſiology, a ſpecies of phoſphorus, ſo called becauſe it ſhines in the night without any light being thrown upon it; ſuch is the phoſphorus made of urine. See PHOSPHORUS.

NOCTUA, a name applied to ſeveral different ſpecies of owls. See OWL.

NOCTURNAL, ſomething relating to the night, in contradiſtinction to diurnal. See the article DIURNAL.

NOCTURNAL ARCH, in aſtronomy, the arch of a circle deſcribed by the ſun, or a ſtar, in the night. See ARCH.

Semi-NOCTURNAL *arch of the ſun*, is that portion of a circle he paſſes over between the lower part of our meridian and the point of the horizon, wherein he ariſes; or between the point of the horizon wherein he ſets, and the lower part of our meridian.

NOCTURNAL, NOCTURLABIUM, an inſtrument chiefly uſed at ſea, to take the altitude or depreſſion of ſome ſtars about the pole, in order to find the latitude and hour of the night.

Some nocturnals are hemiſpheres, or planiſpheres, on the plane of the equinoctial. Theſe commonly in uſe among ſeamen are two; the one adapted to the polar ſtar, and the firſt of the guards of the little bear; the other to the pole-ſtar, and the pointers of the great bear.

This inſtrument conſiſts of two circular plates (plate CLXXXVI. fig. 4.) applied to each other. The greater, which has a handle to hold the inſtrument, is about $2\frac{1}{2}$ inches diameter, and is divided into twelve parts, agreeing to the twelve months, and each month ſub-divided into every fifth day; and ſo as that the middle of the handle correſponds to that day of the year wherein the ſtar here regarded has the ſame right aſcenſion with the ſun. If the inſtrument be fitted for two ſtars, the handle is made moveable. The upper left circle is divided into twenty-four equal parts for the twenty-four hours of the day, and each hour ſub-divided into quarters. Theſe twenty-four hours are noted by twenty-four teeth to be told in the night. Thoſe at the hours 12, are diſtinguiſhed by their length. In the center of the two circular plates is adjuſted a long index, A, moveable upon the upper plate. And the three pieces, *viz.* the two circles and index, are joined by a rivet which is pierced through the center with a hole, through which the ſtar is to be obſerved.

To uſe the NOCTURNAL, turn the upper plate till the long tooth, marked 12, be againſt the day of the month on the under plate: then, bringing the inſtrument near the eye, ſuſpend it by the handle with the plane nearly parallel to the equinoctial; and viewing the pole-ſtar through the hole of the center, turn the index about till, by the edge coming from the center, you ſee the bright ſtar or guard of the little bear (if the inſtrument be fitted to that ſtar): then that tooth of the upper circle, under the edge of the index, is at the hour of the night on the edge of the hour circle: which may be known without a light, by counting the teeth from the longeſt, which is for the hour 12.

NODATED HYPERBOLA, a name given by Sir Iſaac Newton, to a kind of hyperbola, which, by turning round, decuſſates or croſſes itſelf. See HYPERBOLA.

NODE, *nodus*, in ſurgery, a tumour ariſing on the bones, and uſually proceeding from ſome venereal cauſe; being much the ſame with what is otherwiſe called exoſtoſis. See the article EXOSTOSIS.

This word is more particularly applied to the tumours or protuberances ariſing on the joints of old gouty people, called alſo tophi. See the article TOPHUS.

Some give the denomination of nodes, to all tumours formed by a coagulation of viſcous matter in the external parts of the body. See TUMOUR, &c.

NODES, in aſtronomy, the two points wherein the orbit of a planet interſects the ecliptic; ſuch are the points C and D, pl. CLXXXVIII. fig. 1. n° 1. whereof the node C, where the planet aſcends northwards, above the plane of the ecliptic, is called the aſcending node, the northward node, and the head of the dragon, and is marked thus ☊; the other node D, where the planet deſcends to the ſouth, is

called the descending node, the southward node, or the dragon's tail, marked thus ☋. See the article DRAGON.

The line CD, wherein the two circles CEDF and CGDH intersect, is called the line of nodes. It appears from observation, that the line of the nodes of all the planets constantly changes its place, and shifts its situation from east to west, contrary to the order of the signs; and that the line of the moon's nodes, by a retrograde motion, finishes its circulation in the compass of 19 years; after which time, either of the nodes having receded from any point of the ecliptic, returns to the same again: and when the moon is in the node, she is also seen in the ecliptic. If the line of nodes were immoveable, that is, if it had no other motion than that whereby it is carried round the sun, it would always look to the same point of the ecliptic, or would keep parallel to itself, as the axis of the earth does. See EARTH and MOON.

From what has been said, it is evident, that the moon can never be observed precisely in the ecliptic, but twice in every period; that is, when she enters the nodes. When she is at her greatest distance from the nodes; *viz.* in the points E, F, she is said to be in her limits. See LIMIT.

The moon must be in or near one of the nodes, when there is an eclipse of the sun or moon. See ECLIPSE.

To make the foregoing account of the motion of the moon's nodes still clearer, let the plane of n° 2. *ibid.* represent that of the ecliptic, S the sun, T the center of the earth, L the moon in her orbit DN*dn*. N*n* is the line of the nodes passing between the quadrature Q, and the moon's place L, in her last quarter. Let now LP, or any part LS, represent the excess of the sun's action at L, above his action at T; and this being resolved into the force LR, perpendicular to the plane of the moon's orbit; and PR parallel to it, it is the former only that has any effect to alter the position of the orbit, and in this it is wholly exerted. Its effect is twofold: 1. It diminishes its inclination by a motion which we may conceive as performed round the diameter D*d*, to which LT is perpendicular. 2. Being compounded with the moon's tangential motion at L, it gives it an intermediate direction L*t*, through which, and the center, a plane being drawn, must meet the ecliptic nearer the conjunction C, than before.

NODULE, or NODULUS, a word used in pharmacy, for a knot tied in a rag, and including some medicinal ingredients to be suspended in any liquor, as beer, or wine, to give it a tincture, or the like.

It signifies also a parcel of odoriferous simples, tied up in a piece of silk, for the patient to be frequently smelling to.

NODUS, or NODE, in dialling, a certain point or pole in the gnomon of a dial, by the shadow or light whereof, either the hour of the day in dials without furniture, or the parallels of the sun's declination, and his place in the ecliptic, *&c.* in dials with furniture, are shewn. See DIAL.

NODUS is also used for a hole in the ceiling of a room, or in the window, for making of a dial on the floor, wall, or the like.

NOERA, a word used by chemists, for the head of an alembic, or the cover of a cucurbite, or any other vessel used in distillation.

NOETIANS, in church-history, christian heretics in the IIId century, followers of Noetius, a philosopher of Ephesus, who pretended that he was another Moses, sent by God; and that his brother was a new Aaron. His heresy consisted in affirming that there was but one person in the Godhead; and that the Word and the Holy Spirit were but external denominations, given to God, in consequence of different operations; that as creator, he is called Father; as incarnate, Son; and as descending on the apostles, Holy Ghost.

NOGAIAN-TARTARS, a nation which inhabits that part of Circassia, in asiatic Turky, that lies between the Palus Meotis and the Caspian sea.

NOGENT, a town of France, in the province of Champaign, situated on the river Seine, twenty-five miles north-west of Troyes.

NOLA, a town of Italy, in the kingdom of Naples, situated 16 miles east of Naples.

NOLI, a town of Italy in the territory of Genoa, situated on the bay of Genoa, thirty-five miles south-west of that city.

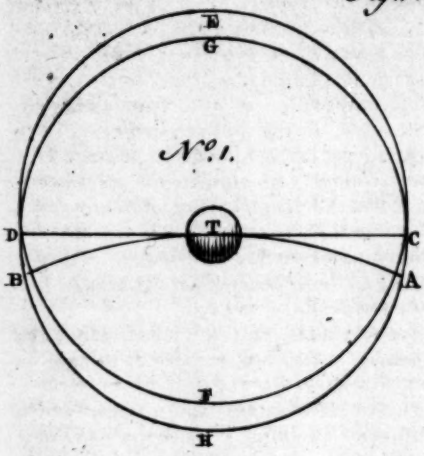
NOLI ME TANGERE, TOUCH ME NOT, in medicine, a malignant eruption in the face, occasioned by an extremely sharp corrosive humour; thus called, either because it affects those who touch it, or because the more it is touched, the worse it grows, and the farther it spreads.

NOLI ME TANGERE, among botanists, the SENSITIVE PLANT, the same with mimosa. See the article MIMOSA.

NOLLE

BRITISH MUSEUM

Fig. 1. NODES.



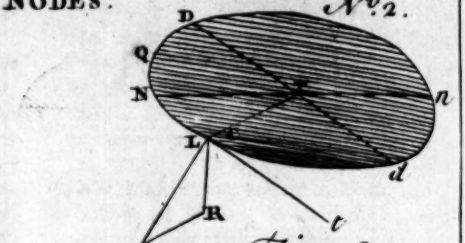


Fig. 3. OR.

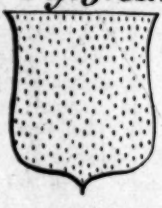


Fig. 4. ORDINATES

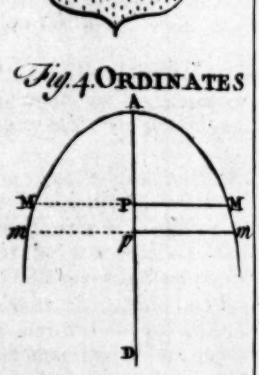


Fig. 2. OPACITY.

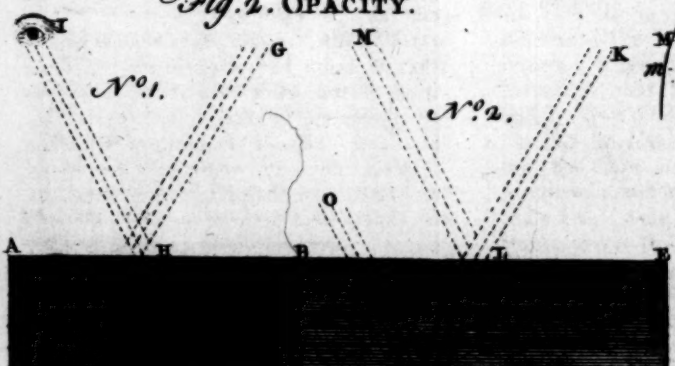


Fig. 5. ORLE.

Fig. 6. OPOSSUM.

J. Jeffreys sculp.

NOLLE PROSEQUI, in law. See the article NON PROS.

NOMADES, in antiquity, a name given to ſeveral nations or people, whoſe whole occupation was to feed their flocks, and who had no fixed place of abode, but were conſtantly ſhifting, according to the conveniencies of paſturage.

NOMANCY, a name given to the art of divining the fates of perſons, by means of the letters that form their names; being nothing elſe but the cabbaliſtic gematria. See the article CABBALA.

NOMARCHA, in egyptian antiquity, the governor or commander of a nome. Egypt was antiently divided into ſeveral regions or quarters, called nomes.

NOMBRE DE DIOS, a town of Mexico, in the province of Darien, a little to the eaſtward of Porto Bello: weſt long. 83°, and north lat. 10°.

NOMBRIL POINT, in heraldry, is the next below the feſs-point, or the very center of the eſcutcheon. See POINT.

Suppoſing the eſcutcheon divided into two equal parts below the feſs, the firſt of theſe diviſions is the nombril, and the lower the baſe.

NOME, or NAME, in algebra, denotes any quantity with a ſign prefixed or added to it, whereby it is connected with ſome other quantity, upon which the whole becomes a binomial, trinomial, or the like: thus $a+b$ is a binomial, $a+b+c$ is a trinomial, whoſe reſpective names or nomes are a and b for the firſt, and a, b, and c, for the ſecond. See the article BINOMIAL, &c.

NOMENCLATOR, in roman antiquity, was uſually a ſlave, who attended upon perſons that ſtood candidates for offices, and prompted or ſuggeſted to them the names of all the citizens they met, that they might court them, and call them by their names; which, among that people, was the higheſt piece of civility.

NOMENCLATORES, among the botanical authors, are thoſe who have employed their labours about ſettling and adjuſting the right names, ſynonyms, and etymologies of names, in regard to the whole vegetable world.

NOMENCLATURE, *nomenclatura*, a catalogue of ſeveral of the more uſual words in any language, with their ſignifications, compiled in order to facilitate the uſe of ſuch words, to thoſe who are to learn the tongue: ſuch are our latin, greek, french, &c. nomenclatures.

NOMENEY, a town of Germany, in the dutchy of Lorrain, ſituated on the river Seille, fifteen miles north of Nancy.

NOMINALS, or NOMINALISTS, a ſect of ſchool-philoſophers, the diſciples and followers of Occam, or Ocham, an engliſh cordelier, in the XIVth century. They were great dealers in words, whence they were vulgarly denominated word-ſellers; but had the denomination of nominaliſts, becauſe that, in oppoſition to the realiſts, they maintained, that words, and not things, were the object of dialectics. See the article REALISTS.

The nominals, with the ſtoics, admit the formal conceptions or ideas of things, as the ſubject and foundation of univerſality; but to this they add names, which repreſent and ſignify, after the ſame univocal manner, and without any diſtinction, a great variety of ſingle things, alike both in genus and ſpecies. See STOICS.

NOMINATION, the act of naming and appointing a perſon for ſome function, employ, or benefice.

NOMINATION, in law, ſignifies the power that a perſon has of appointing a clerk to a patron of a benefice, by him to be preſented to the ordinary. This power or right of nomination a perſon may have by deed, whereby, if the patron refuſes to have the perſon nominated, or inſtead thereof preſents another, the nominator may bring a quare impedit. See QUARE, NOMINATOR, and PATRON.

NOMINATIVE, in grammar, the firſt caſe of nouns, which are declinable. See the articles CASE and NOUN.

The ſimple poſition or laying down of a noun, or name, is called the nominative caſe; yet it is not ſo properly a caſe, as the matter or ground whence the other caſes are to be formed, by the ſeveral changes and inflections given to this firſt termination. Its chief uſe is to be placed in diſcourſe before all verbs, as the ſubject of the propoſition or affirmation.

NOMINATOR, he who preſents a perſon to an office or benefice; whence the perſon named, or preſented, is called nominee. See the article NOMINATION.

It is held, in the caſe of a benefice, that the perſon who has the nomination, is in effect the patron of the church, and the other is but an inſtrument to him that nominates; nevertheleſs, when a nominator does not appoint a clerk within ſix months after the avoidance, but the patron preſents before the biſhop has taken the

the advantage of the lapſe, his clerk is to be admitted.

NOMOPHYLACES, Νομοφυλακες, among the Athenians, magiſtrates who were to ſee the laws executed, being not unlike to our ſheriffs. They had the execution of criminals committed to their care, as alſo the charge of ſuch as were confined priſoners. They had alſo power to ſeize thieves, kidnappers, and highwaymen, upon ſuſpicion; and, if they confeſſed the fact, to put them to death; if not, they were obliged to proſecute them in a judicial way.

NONAGESIMAL, in aſtronomy, the 90th degree of the ecliptic, reckoned from the eaſtern term, or point. See the article ECLIPTIC, &c.

The altitude of the nonageſimal is equal to the angle of the eaſt, and, if continued, paſſes through the poles of the ecliptic; whence the altitude of the nonageſimal, at a given time, under a given elevation of the pole, is eaſily found. If the altitude of the nonageſimal be ſubſtracted from 90°, the remainder is the diſtance of the nonageſimal from the vertex.

NON-ABILITY, in law, incapacity, or an exception taken againſt a plaintiff, in a cauſe, on ſome juſt ground, why he cannot commence a ſuit in law; as his being attainted of felony, outlawry, &c.

NON-AGE, in law, generally ſignifies all the time a perſon continues under the age of one and twenty; but in a ſpecial ſenſe it is all the time a perſon is under the age of fourteen. See AGE.

NON-APPEARANCE, a default in not appearing in a court of judicature. Attornies ſubſcribing warrants for appearing in court, are liable to attachment and fine for non appearance. If a defendant does not appear, and find bail upon a ſcire facias and rule given, judgment may be had againſt him.

NON-ASSUMPSIT, in law, is a general plea in a perſonal action, by which a man denies that he has made any promiſe.

NON-CAPE, in geography, a promontory on the weſt coaſt of Africa, oppoſite the Canary-iſlands.

NON-CLAIM, in law, ſignifies the omiſſion of him who challenges not his right within the time limited by law, as within five years after a fine is levied, &c. by which neglect he is barred of his right.

NON COMPOS MENTIS, in law, is uſed to denote a perſon's not being of ſound memory and underſtanding. Of theſe perſons there are four different kinds, an ideot, a madman, a lunatic who has lucid intervals, and a drunkard who deprives himſelf of reaſon by his own act and deed. In all theſe caſes, except the laſt, one that is non compos mentis ſhall not loſe his life for felony or murder; but the drunkard can have no indulgence on account of the loſs of his reaſon, for, in the eye of the law, his drunkenneſs does not extenuate but aggravate his offence. See IDIOT, LUNATIC, &c.

NON DAMNIFICATUS, in law, is a plea to an action of debt, on a bond, the condition of which is only to ſave the plaintiff harmleſs.

NON DECIMANDO, a cuſtom or preſcription, by which a perſon is diſcharged from the payment of tythes.

NON DISTRINGENDO, in law, a writ granted in divers caſes, not to diſtrain.

NON EST CULPABILIS, or NON CUL, in law, NOT GUILTY, the general plea to an indictment, or action of treſpaſs, by which the defendant denies the crime or fact charged on him.

NON EST FACTUM, in law, is a plea where an action is brought upon a bond or other deed, and the defendant denies it to be his deed.

NON EST INVENTUS, is a ſheriff's return to a writ, that the defendant is not to be found.

NON LIQUET, *it does not appear*; a verdict given by a jury, when a matter is to be deferred to another day of trial.

NON MOLESTANDO, a writ that lies for a perſon, moleſted contrary to the king's protection granted him.

NON-NATURALS, in medicine, ſo called becauſe by their abuſe they become the cauſes of diſeaſes. See DISEASE.

Phyſicians have divided the non-naturals into ſix claſſes, *viz.* the air, meats and drinks, ſleep and watching, motion and reſt, the paſſions of the mind, the retentions and excretions. See AIR, &c.

NON OBSTANTE, NOTWITHSTANDING, a clauſe frequent in ſtatutes and letters patent, importing a licence from the king to do a thing, which at common law might be lawfully done, but being reſtrained by act of parliament, cannot be done without ſuch licence.

NON OMITTAS, a writ that lies where the ſheriff returns, upon a writ or proceſs directed to him, that he has ſent to the bailiff of the franchiſe, who has the return of writs, and that he neglects to ſerve the writs ſent him; upon which the ſheriff is commanded to enter into ſuch franchiſe

franchiſe himſelf, and there to execute the king's proceſs.

NON PLEVIN, a default in not replevying of land in due time.

NON PONENDO IN ASSISIS ET JURATIS, a writ which lies for freeing a perſon from ſerving on aſſizes and juries: where a perſon is exempted by charter, &c. he may ſue the ſheriff for returning him.

NON PROCEDENDO AD ASSISAM REGE INCONSULTO, is a writ granted for ſtoping the trial of a cauſe appertaining to a perſon who is in the king's ſervice, till his majeſty's pleaſure be further known.

NON PROS, or NOLLE PROSEQUI, is where a plaintiff in an action does not declare in a reaſonable time; in which caſe it is uſual for the defendant's attorney to enter a rule for the plaintiff, to declare, after which a non pros may be entered. A nolle proſequi is eſteemed a voluntary confeſſion, that the plaintiff has no cauſe of action; and therefore if a plaintiff enter his nolle proſequi, he ſhall be amerced; and if an informer cauſe the ſame to be entered, the defendant ſhall have coſts.

NON RESIDENCE is particularly applied to ſpiritual perſons, who wilfully abſent themſelves for the ſpace of one month together, or two months at different times in the year, from their benefices; for which they are liable to penalties, by the ſtatute of non reſidence: but biſhops, the king's chaplains, &c. are excepted.

NON RESIDENTIA PRO CLERICIS REGIS, is a writ directed to the biſhop, charging him not to moleſt a clerk employed in the king's ſervice, on account of his non reſidence.

NON SANE MEMORIÆ, is an exception taken to an act, declared to be done by another, importing, that it was done at a time when the party was not in his right ſenſes.

NON-SUIT, ſignifies the dropping of a ſuit or action, or a renouncing thereof by the plaintiff or defendant, which happens moſt commonly upon the diſcovery of ſome error in the plaintiff's proceedings, when the cauſe is ſo far proceeded in, that the jury is ready at the bar to deliver in their verdict.

A non-ſuit, it is ſaid, may be in the following caſes, *viz.* where a perſon brings a perſonal action, and does not proſecute it with effect; or if, upon the trial, he refuſes to ſtand a verdict, then he becomes non-ſuited; ſo where the plaintiff is not ready for trial at the calling and ſwearing of the jury, it is preſumed he does not ſtand to proceed in his cauſe, and on that account the court may call him non-ſuited. Likewiſe, on a trial, when the jury comes in to deliver their verdict, and when the plaintiff is called on, to hear the ſame, in that caſe, if he does not appear after being thrice called by the crier of the court, he is non-ſuited; which non-ſuit is to be recorded by the ſecondary, by the direction of the court: but if he afterwards appears, before the non-ſuit is actually recorded, the court may take the verdict, for that is not a non-ſuit, till it be recorded, upon motion made by the counſel for this purpoſe; and then it is a part of the record, in the nature of a judgment againſt the plaintiff.

NON SUM INFORMATUS, *I am not informed*, a formal anſwer made by an attorney, who is not inſtructed what to ſay in his client's behalf; on which he is deemed to leave the cauſe undefended, and therefore judgment paſſes againſt his client.

NON-TENURE, is a plea in bar to a real action, by which the tenant inſiſts, that he does not hold the lands, &c. mentioned in the plaintiff's count, or at leaſt ſome part of it.

NON-TERM, the time of vacation between term and term, which was formerly called the days of the king's peace.

NONÆ ET DECIMÆ, were payments formerly made to the clergy, by tenants of church-farms: in which caſe nonæ ſignified a duty paid for things belonging to huſbandry: and decimæ, or tithes, were claimed in right of the church.

NONCONFORMISTS, the ſame with diſſenters. See the article DISSENTERS.

NONE, one of the ſeven canonical hours in the romiſh church, anſwering to three o'clock in the afternoon.

NONES, *nonæ*, in the roman calendar, the fifth day of the months January, February, April, June, Auguſt, September, November, and December; and the ſeventh of March, May, July, and October. March, May, July, and October, had ſix days in their nones; becauſe theſe alone, in the antient conſtitution of the year by Numa, had thirty-one days apiece, the reſt having only twenty-nine, and February thirty: but when Cæſar reformed the year, and made other months contain thirty-one days, he did not allot them ſix days of nones.

NOOSE, a name given by ſportſmen to a

ſort of horſe-hair ſpringe, made to take woodcocks, and very ſucceſsful when the proper precautions are taken. The nooſe is made of ſeveral long and ſtrong hairs twiſted together, with a running nooſe at one end, and a large knot at the other, which is to be paſſed through the ſlit of a cleft ſtick, to prevent the nooſe from being pulled away when the bird is caught in it.

NORCIA, a town of Italy, in the territory of the pope, twenty-eight miles eaſt of Spoletto.

NORDEN, a port town of Germany, in the circle of Weſtphalia, and county of Embden, twelve miles north of Embden.

NORFOLK, a county of England, bounded by the German ſea on the north and eaſt; by Suffolk on the ſouth, and by the fens of Lincolnſhire and the iſle of Ely on the weſt.

NORFOLK, a county of Virginia, north of Carolina, and contiguous to that province.

NORKOPPING, a town of Sweden, in the province of Eaſt-Gothland, ninety miles ſouth-weſt of Stockholm.

NORMAL, in geometry, ſignifies the ſame with a perpendicular, and is uſed for a line or plane that interſects another perpendicularly. See PERPENDICULAR, SUBNORMAL, LINE and PLANE.

NORMANDY, a province of France, bounded by the eaſt channel on the north, by Picardy and the Iſle of France on the weſt, by Orleanois on the ſouth, by Britany and another part of the Eaſt channel on the weſt.

NORROY, the title of the third of the three kings at arms. See HERALD.

NORTGON, the palatinate of Bavaria, ſo called.

NORTH, in coſmography, one of the four cardinal points. See COMPASS.

NORTH-CAPE, a promontory of the iſland of Maggero, in the province of Wardbuys, in the north of Norway; it being the moſt northern cape in Europe: eaſt long. 21°, and north lat. 72°.

NORTH-CURRY, a market-town of Somerſetſhire, ſeventeen miles ſouth-weſt of Wells.

NORTH-FORELAND, a cape in the iſle of Thanet, on the eaſt coaſt of Kent, four miles eaſt of Margate.

NORTH RIVER, a great river which riſes in Mexico, and diſcharges itſelf into the gulph of Mexico, in 26° north lat.

NORTH-SEA, a name given to all that part of the Atlantic Ocean, which lies north of Terra-Firma, in South America.

NORTH-WEST *paſſage*. A north-weſt paſſage by Hudſon's Bay, into the pacific ocean, has been more than once attempted of late years, but, hitherto, without ſucceſs. Some greatly doubt of the practicableneſs of ſuch an enterprize, and think the obſervations made by the Ruſſians give us ſmall hopes. But, as they have not yet publiſhed the particulars of their diſcoveries, little can be ſaid about them. Some general things may be ſeen in the Phil. Tranſ. N° 482. ſect. 14. It appears from thence, that the Ruſſians have paſſed between the land of Nova Zembla, and the coaſt of Aſia; and, as the Dutch did formerly diſcover the northern coaſts of Nova Zembla, we may now be well aſſured, that that country is really an iſland.

NORTHALLERTON, a borough-town of the north riding of Yorkſhire, twenty-two miles north-weſt of York.
It ſends two members to parliament.

NORTHAMPTON, the capital of Northamptonſhire, ſituated on the river Nen: weſt long. 55′, and north lat. 52° 15′.
It ſends two members to parliament.

NORTHAMPTON is alſo a county of Virginia, in North America, which forms the ſouth part of the peninſula on the eaſtern ſhore of Virginia.

NORTHAUSEN, a town of Germany, in the circle of Upper Saxony, and territory of Thuringia, fifty-five miles ſouth-weſt of Magdeburg.

NORTHEIM, a town of the dutchy of Brunſwic, in Lower Saxony, forty-five miles ſouth of Hanover.

NORTHING, in navigation, the latitude made by a ſhip, in ſailing towards the north-pole.

NORTHLEECH, a market-town of Gloceſterſhire, fifteen miles eaſt of Gloceſter.

NORTHUMBERLAND, a county of England, bounded on the north by Scotland, on the eaſt by the German ſea, on the ſouth by Durham, and on the weſt by Cumberland and part of Scotland.

NORTHUMBERLAND is alſo a county of Virginia, lying at the mouth of the river Patowmac.

NORTHWICH, a market-town of Cheſhire, ſixteen miles north-eaſt of Cheſter.

NORWAY, a kingdom of Europe, ſituated between 4° and 30° eaſt longitude, and between 58° and 72° north latitude, bounded by the Atlantic Ocean on the north

north and weſt, by ſwediſh Lapland and other provinces of Sweden on the eaſt, and by the ſea called the Categate and Schaggerac on the ſouth. It is a cold barren country ſubject to Denmark.

NORWAY-RAT, *mus norvegicus*, in zoology, an animal of the mus-kind, variegated with black and tawney. It reſembles the common rat in ſhape, but its tail is ſhorter. It breeds in the mountains of Norway, but at times comes down into the low country in vaſt troops, which deſtroy all the vegetable produce, and afterwards dying upon the place, leave a ſtench that occaſions peſtilential fevers. See the article MUS.

NORWICH, a large city of great trade in Norfolk, ſituated twenty miles weſt of Yarmouth and the German ocean: eaſt long. 1° 26′, and north lat. 52° 40′. It ſends two members to parliament.

NOSE, *naſus*, in anatomy, the primary organ of ſmelling. This varies greatly in ſize and figure in different ſubjects: anatomiſts divide its parts into external and internal; thoſe moſt obvious are the dorſum or ridge, which runs along its whole length, one part of which is more prominent than the reſt, and called the ſpine; the orbiculus, or extreme part, which in many is turned round; the alæ or pinnæ, which are the ſides; and the ſeptum, which divides the noſe into two parts, called nares or noſtrils; the hairs alſo are of this number; theſe ſerve to hinder the mucus of the noſtrils from continually running out, and to prevent inſects and extraneous ſubſtances of many kinds from getting in. To theſe may be added the common teguments, *viz.* the epidermis, the fat, and the cutis. The upper part of the noſe is rigid, and compoſed of bones; the lower part is compoſed of a number of cartilages, muſcles, and membranes.

The internal parts of the noſe are, the bones; as the oſſa naſi, the maxillaria, the os cribriforme, the oſſa ſpongioſa, the os frontale, the lachrymalia, the os palati, the vomer, and the os ſphenoides. The cartilages, which form the lower part, are connected by membranes, in order to render it flexible; the firſt of theſe form the anterior part of the ſeptum narium; there are two very large and conſpicuous ones in each of the alæ, and between theſe there are placed ſometimes two, ſometimes three, and ſometimes more ſmaller ones: the ſeptum narium is cartilaginous in its anterior and lower part; in its poſterior and upper, it is bo-

ney: and theſe parts are ſurrounded by robuſt and ſtrong membranes, which join them firmly together.

There are two paſſages from the noſtrils into the mouth, deſtined for the paſſage of air and of the mucous matter: there are ſinuſes in the maxillary, frontal, and ſphenoidal bones; and cellulæ in the os ethmoides, which increaſe the hollow of the noſe, and thus give room for the greater expanſion of the pituitary membrane. There are alſo certain inequalities and eminences of the oſſa turbinata or oſſa ſpongioſa of the noſtrils, which ſerve partly the ſame purpoſes, and partly to prevent inſects and other extraneous matter, and even the cold air, from getting immediately that way into the mouth. There is likewiſe a ſoft and vaſcular membrane, which inveſts the noſtrils, and all the ſinuſes and irregularities; this is called the membrana mucoſa, and pituitaria of Schneider, and is the primary organ of ſmelling, and the place of ſecretion of the mucus of the noſtrils. The openings of the excretory ducts of this membrane are extremely conſpicuous in the head of an ox. There are alſo a number of little glands under this membrane, eſpecially about the middle of the ſeptum, which are deſtined to the ſecretion of a mucous humour, like that of the reſt of the glands of this part.

The arteries, which are diſperſed in prodigious numbers through this membrane, ariſe from the carotids; theſe alſo ſerve for the ſecretion of this mucus. The veins are from the jugulars, by which the abundant blood not employed for theſe purpoſes, is returned. The nerves diſperſed through the membrana pituitaria, are, 1. The olfactorii, or olfactory nerves; which are ſuppoſed to be of uſe in ſmelling, and are ſufficiently obſervable, tho' they are leſs in human ſubjects than in quadrupeds. And, 2. Some branches of the fifth pair, which terminate in the hairs, and conſtitute the true organ of ſmelling.

Under the membrana pituitaria, there is alſo another very thin membrane, which ſerves to inveſt the bones and cartilages; this, where it ſurrounds the former, is called periоſteum; where the latter, perichondrium. The foramina in the noſtrils are, 1. Thoſe at the frontal, the maxillary, and the ſphenoidal ſinuſes, and the cellulæ of the os ethmoides, ſerving for the communication of theſe ſinuſes with the noſtrils. 2. The orifices of the lacrymal ducts, which open into the noſtrils.

And, 3. The ducts from the noſe into the mouth; theſe, in a ſkeleton, are open and are obvious juſt behind the dentes inciſores of the upper jaw; but in the diſſection of recent bodies, they are not found abſolutely to open into the mouth at all, nor indeed do they in living ſubjects, for they are cloſed up by the membrane of the palate.

The uſes of the noſe are, its giving us the ſenſe of ſmelling; its ſerving in the great office of reſpiration, and in modelling the voice; in receiving the abundant humours from the eyes, and in adding to the beauty of the face. It is certain, that there is no paſſage to the brain for the air, much leſs for the powders ſnuffed up the noſtrils: and whether there be any for tranſmitting a mucous humour from the brain, in order to its being diſcharged at the noſtrils, as the antients, and as Schelvogtius, and ſome other of the moderns, have ſuppoſed, is not yet aſcertained. See the article NOSTRILS.

Wounds of the NOSE. Theſe are generally cured by the dry ſuture; but where the wound divides the cartilage, and penetrates ſo deep, that its lips cannot be kept in contact, by the application of ſticking plaſters, the true ſuture muſt be made through the ſkin, on each ſide of the wound. Though it ſounds very unlike truth, that any part of the noſe ſhould be entirely ſeparated from the reſt, and afterwards united to it again, by means of ſutures; yet Roonhuys, in his Obſerv. Chirurg. XXIV. gives an inſtance of a noſe ſlit down longitudinally, and cured by ſuture. M. Blegny, in Zod. Med. Gall. ſpeaks of a ſoldier, whoſe noſe was cut off by a ſcymeter, and afterwards ſewed on again ſo well by the ſurgeon, that the ſcar could ſcarcely be perceived; and M. Garengeot, in tom. iii. p. 55. of his Surgery, gives an account of a noſe that was conjoined again by ſuture, after it was bit off. When the naſal bones are fractured, it is uſual to place ſmall tubes, of ſilver or lead, under them, for ſome time, to prevent the paſſage of the noſe being ſtopped by the ſhooting out of the new fleſh. Externally, ſome vulnerary balſam or glutinous powder is to be uſed, and covered with ſticking plaſters, which muſt be kept on with the four-headed bandage.

When this member is abſolutely loſt, we muſt ſupply its defects with an artificial noſe of wood, or ſilver: ſuch an artificial noſe, painted to the life and adapted by proper ſprings and ſcrews, may render the accident and deformity imperceptible.

Fracture of the NOSE. In the noſe, both the bone and cartilages are ſubject to fractures; and if the injury is very great, they can never be ſo perfectly cured, but that ſome deformity will remain; beſides, the vicinity of this part to the brain, which is frequently injured at the ſame time, renders caſes of this kind often dangerous: a caries alſo, or a polypus, are no uncommon attendants on this diſorder. In order to reſtore the bones of the noſe to their proper ſituation, the patient is to be placed in a ſeat oppoſite to the light, and his head is to be held back, while the ſurgeon raiſes the depreſſed part with a ſpatula, a probe, or a quill, applying externally the thumb of one hand, and the fore-finger of the other. If the bones are fractured on both ſides, they are to be raiſed on each in this manner, and the cavity of the noſtrils is to be filled up with long doſſils, to prevent the bones from collapſing; covering the part alſo, for this end, with a plaſter, applying firſt the dreſſings common to recent wounds. If the bone be fractured into ſeveral ſplinters, they are to be reduced into their proper places, by the fingers; but if a ſplinter is ſo entirely ſeparated from the bone, that it will not eaſily unite with it again, it is to be taken out with the forceps. If no caries or abſceſs intervene, the bones will unite in about fourteen days. If the bone ſhould require a ſtronger ſupport than what has hitherto been mentioned, one may be formed out of ſtrong paper, either ſingle or double, adapted to each ſide of the noſe, and ſupported by bolſters, and the whole muſt be kept in its place by a four-headed bandage, not tied too tight. When the fracture of this part is accompanied with an external wound, after the bones are replaced, dreſs the wound firſt with dry lint, covering it with a vulnerary plaſter, afterwards uſe balſamic medicines; but all thoſe that are oily or greaſy, are to be carefully avoided, both here, and in all other caſes where the bones are injured.

Luxation of the NOSE. When the bones are ſeparated from each other, or diſtorted out of their places, they are to be replaced by a probe, or quill, thruſt up the noſtrils, guiding the parts thus raiſed up, with the other hand, into their proper places, as above deſcribed, under *Fractures*; after which there is ſcarce any

any thing to be done, but to let a piece of ſticking plaſter lie upon the noſe for ſome time.

Another diſorder to which the noſe is liable, is that of the preternatural cloſing of the noſtrils, which is ſometimes owing to careleſs treatment in the ſmall-pox, in the bad ſort of which the noſtrils have been known to cloſe, and adhere ſo ſtrongly to the upper lip, which is turned back at the ſame time, as to leave no poſſibility of ſhutting the mouth. In this unhappy caſe, the only relief is by the knife, ſeparating the lip from the noſe, and then opening a paſſage through each of the noſtrils, which are to be kept open with leaden pipes, and the lip preſſed down into its natural poſition by a compreſs and bandage, and this continued till the wounds are cicatrized.

For the polypus and ulcer in the noſe, ſee the articles POLYPUS and OZÆNA.

Bleeding at the NOSE. See HÆMORRHAGE.

NOSTRILS, *Nares*, in anatomy, the two apertures or cavities of the noſe, through which the air paſſes, and which ſerve to convey odours, and to carry off the pituita ſeparated in the ſinuſes of the baſe of the cranium. See the article NOSE.

NOT GUILTY, *non eſt culpabilis*, in law. See the article NON EST, *&c.*

NOTABILIA BONA, in law. See BONA.

NOTARICON, the third part of the jewiſh cabbala. See the article CABBALA.

NOTARY, *notarius*, ſignifies a perſon, uſually ſome ſcrivener, who takes notes, or frames ſhort draughts, of contracts, obligations, charter-parties, or other writings. At preſent we call him a notary public, who publicly atteſts deeds, or writings, in order to make them authentic in another nation: but he is principally employed in buſineſs concerning merchants, as making proteſts of bills of exchange, *&c.* And noting a bill, is where he goes to take notice of a merchant's refuſal to accept or pay the ſame. See the article BILL.

The learned civilian Domat obſerves, that a diſtinction between a voluntary and contentious juriſdiction obliges us to take notice of a particular kind of officers, whoſe functions are of a very great and very frequent uſe, and who have a kind of voluntary juriſdiction, without any ſhare of the contentious juriſdiction, which are the public notaries: for the functions of notaries imply two characters of a voluntary juriſdiction; the firſt conſiſts in this, that their preſence and their ſignature ſerve as a proof of the truth of the acts which are ſued in their preſence; and that whereas in the writings which are called private, that is to ſay, which are ſigned only by the parties, their ſignatures being unknown in courts of juſtice, it is neceſſary to verify them, if they are called in queſtion: the ſignatures of notaries, who are public officers, carry along with them the truth of the acts which they ſign. And the ſecond of theſe characters conſiſts in this, that the acts which contain ſome obligations of one party towards another, being ſigned by a notary public, gives a right of mortgage on the eſtate of the perſon who is bound, which a private bond or obligation ſigned only by the party would not give.

Eccleſiaſtical NOTARIES, were officers in the firſt ages of the church, whoſe buſineſs it was to collect and preſerve the acts of martyrs.

NOTATION, in arithmetic and algebra, the method of expreſſing numbers or quantities by ſigns or characters, appropriated for that purpoſe. See NUMERATION, ALGEBRA, CHARACTER, *&c.*

There is one thing which deſerves particular notice, in regard to this ſubject, and that is, the great advantages that may redound to ſcience, by a happy notation, or expreſſion of our thoughts. It is owing entirely to this, and the method of denoting the ſeveral combinations of numbers, by figures ſtanding in different places; that the moſt complicated operations in arithmetic, are managed with ſo much eaſe and diſpatch. Nor is it leſs apparent, that the diſcoveries made by algebra are wholly to be imputed to that ſymbolical language made uſe of in it; for by this means we are enabled to repreſent things in the form of equations; and by variouſly proceeding with theſe equations, to trace out, ſtep by ſtep, the ſeveral particulars we want to know. Add to all this, that by ſuch a notation, the eyes and imagination are alſo made ſubſervient to the diſcovery of truth; for the thoughts of the mind riſe up and diſappear, according as we ſet ourſelves to call them into view; and therefore, without ſome particular method of fixing and aſcertaining them as they occur, the retrieving them when out of ſight would be no leſs painful, than the very firſt exerciſe of deducing them one from another. As, therefore, we have, frequent occaſion to look back upon the diſcoveries

already made, could theſe be no otherwiſe brought into view, than by the ſame courſe of thinking in which they were firſt traced, ſo many different attentions at once muſt needs greatly diſtract the mind, and be attended with infinite trouble and fatigue. But now, the method of fixing and aſcertaining our thoughts by a happy and well choſen notation, entirely removes all thoſe obſtacles; for thus, when we have occaſion to turn to any former diſcovery, as care is taken all along to delineate them in proper characters, we need only caſt our eye on that part of the proceſs where they ſtand expreſſed, which will lay them at once open to the mind in their true and genuine form. By this means we can take, at any time, a quick and ready ſurvey of our progreſs, and running over the ſeveral concluſions already gained, ſee more diſtinctly what helps they furniſh towards obtaining thoſe others we are ſtill in purſuit of. Nay, farther, as the amount of every ſtep of the inveſtigation lies before us, by comparing them variouſly among themſelves, and adjuſting them one to another, we come at length to diſcern the reſult of the whole, and are enabled to form our ſeveral diſcoveries into an uniform and well-connected ſyſtem of truths, which is the end and aim of all our inquiries.

NOTE, *nota*, is uſed for a character or abbreviature, ſerving to denote or expreſs ſomething in a little compaſs.

NOTES, in muſic, characters which mark the ſounds; *i. e.* the elevations and fallings of the voice, and the ſwiftneſs and ſlowneſs of its motions. In general, under notes are comprehended all the ſigns or characters uſed in muſic, though in propriety the word only implies the marks which denote the degrees of gravity and acuteneſs to be given to each ſound. See SOUND, CHARACTER, and GRAVITY.

The Greeks uſed the common letters of their alphabet for muſical notes, and in regard more notes were needed than they had letters, the defect was ſupplied by the different ſituation of the letters: thus the ſame letter Π expreſſed different notes in all the following forms Π, ⊓, ⊏, ⊐, ⊓, ⊓. For every ſeveral mode they had eighteen ſigns. Now Alypius gives us ſigns for fifteen different modes, which, with the differences of the genera, and the diſtinction between voice and inſtrument, Mr. Malcolm makes 1620 notes. Not that they had ſo many diſtinct characters, but the ſame characters had different ſignifications upon different occaſions, as ϕ in the diatonic genus is lychanos hypaton of the lydian mode, and hypate meſon of the phrygian, and ſo of others.

The Latins, in the time of Boëthius, had eaſed themſelves of this needleſs burden, and only uſed fifteen letters of their alphabet for notes. Theſe, pope Gregory, conſidering that the ſecond octave was in effect the ſame with the firſt, and that the order was the ſame in the upper and lower octave of the gamut, afterwards reduced to ſeven, which were to be repeated in a different character: at length, in the eleventh century, Guido Aretine, a benedictine monk, inſtead of the letters ſubſtituted ſix ſyllables, *ut*, *re*, *mi*, *fa*, *ſol*, *la*, placing them in different lines, and marking them with points. Laſtly, it was thought proper to add notes likewiſe in the ſpaces. See the article GAMUT.

Hitherto the notes only ſerved to expreſs the degrees of tune: they were all of equal value as to time, till about the year 1330, when John De Muris, doctor of Paris, gave different figures to different points, to expreſs the quantity of time each was to be dwelt upon. See TIME.

There are three things to be conſidered in theſe notes, 1. The quantity, *i. e.* the ſize and figure of the head. 2. The quality, *i. e.* the colour of the head, whether it be white or black, full or open. 3. The properties, as the Italians expreſs themſelves, *viz.* whether the note is accompanied with a virgula or comma, or not. It muſt likewiſe be conſidered whether the notes be ſeparate and diſtinct, or bound together. Each of theſe, *viz.* the quantity, quality, *&c.* may be ſeen under the articles MINIM, CROTCHET, *&c.*

Mathematicians compute that one may make 720 changes or varieties with ſix notes, without ever repeating the ſame twice; and that of the notes of each octave, one may make 40320 different tunes or ſongs. See the article TUNE.

NOTE is likewiſe uſed for a mark made in a book or writing where there occurs ſomething remarkable and worthy of particular notice: as alſo for an obſervation or explication of ſome paſſage in an author added in the margin, at the bottom of the page, or elſewhere, by an editor, in which ſenſe it ſtands contradiſtinguiſhed to text. The notes make the principal difference in the editions of claſſic,

&c. authors. We have Virgil, Horace, Terence, *&c.* with Dacier's notes, Dauphin's notes, notes variorum, *&c.*

NOTE is alſo a minute, or ſhort writing, containing ſome article of buſineſs, in which ſenſe we ſay, promiſſary note, note of hand, bank note, *&c.*

To NOTE *a bill.* See the articles NOTARY, PROTEST, and BILL.

NOTE *of a fine,* in law, an abſtract of the fine or contract made by the chirographer, before the ſame is engroſſed.

NOTHÆ CASTÆ, in anatomy, the five loweſt ribs on each ſide. They are called baſtard or ſpurious ribs, in regard they do not join with the breaſt-bone as the other ribs do; nor are they, like the reſt, bony, but cartilaginous. See RIBS.

NOTHING, *nihil.* The ſchoolmen diſtinguiſh between nothing taken ſtrictly, being that which is impoſſible, or implies a contradiction; and nothing taken more generally, being applied both to what is poſſible and impoſſible. Again, they diſtinguiſh nothing into negative, which is the abſence of reality in any ſubject; and privative, which is the abſence of reality in a ſubject capable thereof, or wherein it ought to be found.

NOTHUS, νόθος, ſignifies ſpurious or baſtard, whence it is figuratively applied by phyſicians, *&c.* to ſuch diſeaſes, as though in reſpect of a ſimilitude of ſymptoms, *&c.* they have the ſame denomination as ſome others, yet are of a different origin, ſeat, or the like, from the ſame.

NOTICE, in law, is defined to be the making of ſomething known, which a man might be ignorant of before: and it has divers effects in our law; for thereby the party giving the ſame, may reap a benefit which he otherwiſe ſhould not have had; and by this means the perſon to whom it is given, is liable to ſome charge or action to which without it he had not been ſubject. Notice is in ſeveral reſpects required to be given in order to juſtify proceedings; yet none is bound by law to give notice to another of what ſuch other may inform himſelf. In the caſe of a promiſe, it has been held, that where a penalty is to be recovered, there notice is neceſſary; but where the plaintiff ſues for damages, the defendant has ſufficient notice, by the action brought againſt him. Likewiſe, if a perſon is obliged by an aſſumpſit in general to do a certain thing to another, the perſon to whom the promiſe is made muſt give notice when he would have him perform it; and yet where another perſon is to to it, in ſuch caſe, he to whom the thing is to be done ſhall not be compelled to give notice to that third perſon, as to the doing thereof: but the party muſt at his peril procure it. Where one enters into a bond to make ſuch an aſſurance as the counſel of the obligee ſhall adviſe, the obligor is to have notice that the obligee's counſel has adviſed the ſame. If a thing lies in the knowledge of the plaintiff in an action, there ought to be notice given of it to the defendant. Upon all writs of inquiry of damages, either in real or perſonal actions, notice muſt be given to the other party in the ſuit; and want of notice on divers occaſions, is often the cauſe of arreſt of judgment, *&c.*

NOTION, in logic, an idea or repreſentation of any thing in the mind. See the article IDEA.

This term, and the word idea, are often taken in the ſame ſenſe; but the ingenious biſhop Berkeley obſerves, that we cannot ſtrictly be ſaid to have an idea of an active being, or of an action, although we may be ſaid to have a notion of them. I have, ſays he, ſome knowledge or notion of my mind, and its acts about ideas, inaſmuch as I know or underſtand what is meant by theſe words. What I know, that I have ſome notion of. However, continues our author, if the world will have it ſo, the terms idea and notion may be uſed convertibly. By yet it conduces to clearneſs and propriety that we diſtinguiſh things very different by different names. It is alſo to be remarked, that in all relations including an act of the mind we cannot ſo properly be ſaid to have an idea, but rather a notion of the relation or habitudes between things; but if in the modern way the word idea is extended to ſpirits, relations, and acts, this is after all an affair of a verbal concern.

It is an eſtabliſhed opinion among ſome philoſophers, that there are in the underſtanding certain innate principles, ſome primary or common notions, κοιναὶ ἔννοιαι, as it were ſtampt upon the mind of man, and which the ſoul receives in its very firſt being, and brings into the world with it. But this opinion is accurately diſcuſſed, and refuted by Mr. Locke, who ſhews how men, barely by the uſe of their natural faculties, may attain to all the knowledge they have, without any ſuch original notions or principles.

principles. See IDEA and KNOWLEDGE.

NOTITIA, in literary hiſtory, a book that gives an account of a particular country, city, or other place: ſuch is the Notitia Imperii Romani, Notitia Romæ Antiquæ, &c.

NOTO, the capital of a province of the ſame name, in Sicily, twenty miles ſouth of Syracuſe: eaſt long. 15°, north lat. 37° 15'.

NOTONECTA, the BOAT-FLY, in the hiſtory of inſects, a genus of inſects of the claſs of the ſcleroptera, the roſtrum or ſnout of which is inflected, the antennæ are very ſhort; the wings, which are four in number, are cruciated, and the legs are formed for ſwimming.

NOTORIOUS, ſomething that is publicly known, and therefore needs no proof.

NOTRE DAME, OUR LADY, an appellation frequently given to the Holy Virgin: and hence we meet with churches of notre dame, as that at Paris; alſo feaſts, nunneries, &c. of notre dame.

NOTTEBURG, a city of Ruſſia, ſituated on an iſland in the lake Lodoga, twenty-five miles eaſt of Peterſburg.

NOTTINGHAM, the capital of Nottinghamſhire, ſituated about a mile north of the river Trent: weſt longitude 1° 5', north latitude 53°.

It ſends two members to parliament.

NOVA, NEW, ſomething oppoſed to old. Hence,

NEVA-SCOTIA, New SCOTLAND. See the article SCOTLAND.

NOVA-ZEMBLA, or Newland, called by the Dutch the iſland of Weygats, is ſituated in the frozen ocean, between 50° and 80° eaſt longitude, and between 70° north latitude and the north pole; it is ſeparated from the province of Samoieda, in Ruſſia, by the ſtraits of Weygats; but whether it be an iſland, or part of ſome great continent, is uncertain, no ſhips having ever paſſed to the northward of it.

NOVALE, in our antient cuſtoms, ſignifies land newly ploughed, that had not been tilled before in the memory of man. Novale is alſo ſometimes uſed for fallow land.

NOVARA, the capital of the Novareſe, in the dutchy of Milan, forty miles weſt of Milan.

NOVATIANS, a chriſtian ſect which ſprang up in the third century, ſo called from Novatian, a prieſt of Rome, or Novatus, an african biſhop, who ſeparated from the communion of pope Cornelius, whom Novatian charged with a criminal lenity towards thoſe who had apoſtatized during the perſecution of Decius. He denied the church's power of remitting mortal ſins, upon the offender's repentance; and at laſt went ſo far as to deny that the apoſtles could ever hope for pardon even from God himſelf. Novatus coming to Rome, joined with the followers of Novatian, and added to theſe rigid doctrines another, which was the unlawfulneſs of ſecond marriages, againſt which this became as ſevere as againſt apoſtates; denying communication to ſuch as married a ſecond time after baptiſm, and treating widows who married again, as adultereſſes. The two leaders were proſcribed and declared heretics, not for excluding penitents from communion, but for denying that the church had the power of remitting ſins.

NOVATION, or INNOVATION, in the civil law, denotes the change of one kind of obligation for another; as when a promiſe is accepted inſtead of a written obligation. See the article OBLIGATION.

NOVEL, in the civil law, a term uſed for the conſtitutions of ſeveral emperors, as of Juſtin, Tiberius, Leo, and more particularly of thoſe of Juſtinian. The conſtitutions of Juſtinian were called novels, either from their producing a great alteration in the face of the antient law, or becauſe they were made on new caſes, and after the reviſal of the antient code, compiled by order of that emperor. Thus the conſtitutions of the emperors Theodoſius, Valentinian, Marcian, &c. were alſo called novels, on account of their being publiſhed after the theodoſian code.

NOVEL, in matters of literature, a fictitious hiſtory of a ſeries of ſurprizing and entertaining events in common life, wherein the rules of probability are or ought to be ſtrictly preſerved; in which it differs from a romance, where the hero and heroine is ſome prince and princeſs, and the events which lead to the cataſtrophe, are in general highly abſurd and unnatural. The beſt novels are thoſe which by means of a well told ſtory, convey a number of noble and elevated ſentiments, and inſtruct the reader in the knowledge of mankind.

NOVEL ASSIGNMENT, in law, an aſſignment of time, place, or the like, in an action of treſpaſs, otherwiſe than it was before aſſigned.

This

This is practiſed, where an action of treſpaſs being brought for breaking a cloſe, generally; and the defendant, in his plea, juſtifies himſelf in a place where no treſpaſs was committed; in which caſe, the plaintiff aſſigns the cloſe, or place where the treſpaſs was done, and to this the defendant muſt plead.

NOVEL DISSEISIN. See the article ASSISE *of novel diſſeiſin.*

NOVELLARA, a town of Italy, in the dutchy of Mantua, twenty miles ſouth of the city of Mantua.

NOVEMBER, in chronology, the eleventh month of the julian year, conſiſting only of thirty days: it got the name of November, as being the ninth month of Romulus's year, which began with March. See the articles MONTH and YEAR.

NOVEMSILES, or NOVENSILES DII, in roman antiquity, certain gods brought to Rome by the Sabines, and ſo called as being nine in number, *viz.* Lara, Veſta, Minerva, Feronia, Concord, Fidelity, Fortune, Chance, Health.

Some underſtand, by novenſiles dii, new created gods, or thoſe whoſe worſhip was brought from ſome foreign country to Rome; whilſt others pretend, they ſignified the nine muſes.

NOVEMVIRI, the nine magiſtrates of Athens, more uſually called archons. See the article ARCHON.

NOVENDIALE, or NOVEMDIALE, a nine-days ſolemnity, obſerved with ſacrifices by the antient Romans, to divert the miſchiefs with which they were threatened with prodigies, and to appeaſe the anger of the gods.

NOVI, a town of Italy, twenty-five miles north-weſt of Genoa.

NOVIBAZAR, a city of european Turky, in the province of Servia, 160 miles ſouth of Belgrade: eaſt long. 22°, north lat. 43° 30′.

NOVICE, in general, denotes a perſon not yet ſkilled, or experienced, in any art or profeſſion.

In the countries where monachiſm prevails, novices are the candidates, or probationers, for a religious life. See the article MONK.

This noviciate laſts a year, at leaſt; in ſome monaſteries more; after which the novices, by profeſſing themſelves and taking the vows, become dead to the world in a civil ſenſe.

NOVIGRAD, a town of Hungary, ſixteen miles north of Buda, in 19° 5′ eaſt longitude, and 48° north latitude.

NOVIGRAD is alſo a town of Dalmatia, in 17° 30′ eaſt longitude, and 44° 30′ north latitude.

NOUN, *nomen*, in grammar, a part of ſpeech, which ſignifies things without any relation to time; as a man, a houſe, ſweet, bitter, *&c.*

The words which ſignify the ſimple objects of our thoughts are, in all languages but the Engliſh, called names: but our firſt formers of grammar, either out of affectation or folly, corrupted the latin word *nomen*, into the barbarous ſound *noun*, as it is called in the vulgar grammars. And thus they have made a diviſion of names, calling the name of a thing or ſubſtance, a noun-ſubſtantive; and that which ſignifies the manner or quality, a noun-adjective. See NAME, SUBSTANTIVE, and ADJECTIVE.

Nouns are alſo divided into proper and appellative. See the articles PROPER and APPELLATIVE.

NOVOGOROD, the capital of a province of the ſame name in Muſcovy, ſituated on the river Wolcoff, 130 miles ſouth-eaſt of Peterſburg: eaſt long. 34°, north lat. 58°.

It is an archbiſhop's ſee, and has 180 churches and monaſteries.

NOVOGRODECK, a city of Lithuania, in Poland; eaſt long. 25° 30′, north lat. 53° 45′.

NOURISHMENT, or NUTRITION, in phyſiology. See NUTRITION.

NOWED, in heraldry, ſignifies knotted, from the latin *nodatus*; being applied to the tails of ſuch creatures as are very long, and ſometimes repreſented in coat-armour, as if tied up in a knot.

NOYA, a town of Galicia, in Spain, ſituated in the river Tamara, fifteen miles weſt of Compoſtella.

NOYON, a town of the iſle of France, fifty miles north-eaſt of Paris.

NUBECULA, in ſurgery and medicine, a diſtemper of the eye, otherwiſe called leucoma. See the article LEUCOMA.

NUBECULA is alſo uſed for a matter in form of a cloud ſuſpended in the middle of the urine. See the article URINE.

NUBIA, a country of Africa, bounded by the deſart of Barca, on the north; by Egypt and Abyſſinia, on the eaſt; by the Lower Ethiopia, on the ſouth; and by the deſarts of Africa, on the weſt.

NUBILES ANNI, the legal age of marriage. See the article MARRIAGE.

NUCHA,

NUCHA, in anatomy, the nape of the neck. See the article NECK.

NUCIFEROUS TREES, ſuch as bear nuts. See the articles TREE and NUT.

NUCIFRAGA, in ornithology, a bird otherwiſe called coccothrauſtes. See the article COCCOTHRAUSTES.

NUCKIANÆ GLANDULÆ, in anatomy, a number of ſmall glands, ſituated between the abducent muſcle of the eye, and the upper part of the os jugale. See the articles EYE, GLAND, &c.

NUCLEUS, in general, denotes the kernel of a nut, or even any ſeed incloſed within a huſk.

The term nucleus is alſo uſed for the body of a comet, otherwiſe called its head. See the article COMET.

Among the antient architects, nucleus ſignified the middle flooring, which conſiſted of a ſtrong cement, over which they laid the pavement bound with mortar.

NUDE COMPACT, *nudum pactum*, in law, a contract made without any conſideration. See the article CONTRACT.

NUDE MATTER, in law, ſignifies a bare allegation of ſomewhat done.

NUDIPEDALIA, among the antients, a feſtival in which all were obliged to walk bare-footed. This was done on account of ſome public calamity; as the plague, famine, an intenſe drought and the like. It was likewiſe uſual for the Roman matrons, when any ſupplication and vows were to be made to the goddeſs Veſta, to walk in proceſſion to her temple bare-footed.

NUDITIES, in painting and ſculpture, denotes thoſe parts of an human figure which are not covered with any drapery; or thoſe parts where the carnation appears.

NUL TIEL RECORD, in law, is what the plaintiff generally pleads, on the defendant's pleading matter of record in bar of the action brought by the plaintiff.

NULLITY, in law, ſignifies any thing that is null or void: thus there is a nullity of marriage, where perſons marry within the degrees, or where infants marry without conſent of their parents or guardians. See the article MARRIAGE.

NUMBER, *numerus*, in arithmetic, an aſſemblage of ſeveral units, or things of the ſame kind.

Number, ſays Malcolm, is either abſtract or applicate; abſtract, when referred to things in general, without attending to their particular properties; and applicate, when conſidered as the number of a particular ſort of things, as yards, trees, or the like.

When particular things are mentioned, there is always ſomething more conſidered than barely their numbers; ſo that what is true of numbers in the abſtract, or when nothing but the number of things is conſidered, will not be true, when the queſtion is limited to particular things: for inſtance, the number two is leſs than three; yet two yards is a greater quantity than three inches; and the reaſon is, becauſe regard muſt be had to their different natures as well as number, whenever things of a different ſpecies are conſidered; for though we can compare the number of ſuch things abſtractedly, yet we cannot compare them in any applicate ſenſe. And this difference is neceſſary to be conſidered, becauſe upon it the true ſenſe, and the poſſibility or impoſſibility of ſome queſtions depend.

Number is unlimited in reſpect of increaſe, becauſe we can never conceive a number ſo great, but ſtill there is a greater. However, in reſpect of decreaſe, it is limited; unity being the firſt and leaſt number, below which therefore it cannot deſcend.

Kinds and diſtinctions of NUMBERS. Mathematicians, conſidering number under a great many relations, have eſtabliſhed the following diſtinctions.

Broken numbers are the ſame with fractions. See the article FRACTION.

Cardinal numbers are thoſe which expreſs the quantity of units, as 1, 2, 3, 4, &c. whereas ordinal numbers are thoſe which expreſs order, as 1ſt, 2d, 3d, &c.

Compound number, one diviſible by ſome other number beſides unity; as 12, which is diviſible by 2, 3, 4, and 6. Numbers, as 12 and 15, which have ſome common meaſure beſides unity, are ſaid to be compound numbers among themſelves.

Cubic number is the product of a ſquare number by its root: ſuch is 27, as being the product of the ſquare number 9, by its root 3. All cubic numbers whoſe root is leſs than 6, being divided by 6, the remainder is the root itſelf: thus $27 \div 6$ leaves the remainder 3, its root; 216, the cube of 6, being divided by 6, leaves no remainder; 343, the cube of 7, leaves a remainder 1, which, added to 6, is the cube root; and 512, the cube of 8, divided by 6, leaves a remainder 2, which, added to 6, is the cube root. Hence the remainders of the diviſions of the cubes above 216, divided by 6, being added

added to 6, always gives the root of the cube ſo divided, till that remainder be 5, and conſequently 11, the cube-root of the number divided. But the cubic numbers above this, being divided by 6, there remains nothing, the cube-root being 12. Thus the remainders of the higher cubes are to be added to 12, and not to 6; till you come to 18, when the remainder of the diviſion muſt be added to 18; and ſo on *ad infinitum*.

Determinate number is that referred to ſome given unit, as a ternary or three: whereas an indeterminate one, is that referred to unity in general, and is called quantity.

Homogeneal numbers, are thoſe referred to the ſame unit; as thoſe referred to different units are termed heterogeneal.

Whole numbers are otherwiſe called integers. See the article INTEGER.

Rational number is one commenſurable with unity; as a number, incommenſurable with unity, is termed irrational or a ſurd. See the article SURD.

In the ſame manner a rational whole number, is that whereof unity is an aliquot part; a rational broken number, that equal to ſome aliquot part of unity; and a rational mixed number, that conſiſting of a whole number and a broken one.

Even number, that which may be divided into two equal parts without any fraction, as, 6, 12, *&c.* The ſum, difference, and product of any number of even numbers, is always an even number.

An evenly even number, is that which may be meaſured, or divided, without any remainder, by another even number, as 4 by 2.

An unevenly even number, when a number may be equally divided by an uneven number, as 20 by 5.

Uneven number, that which exceeds an even number, at leaſt by unity, or which cannot be divided into two equal parts, as 3, 5, *&c.*

The ſum or difference of two uneven numbers makes an even number; but the factum of two uneven ones makes an uneven number.

If an even number be added to an uneven one, or if the one be ſubtracted from the other, in the former caſe the ſum, in the latter the difference, is an uneven number; but the factum of an even and uneven number is even.

The ſum of any even number of uneven numbers is an even number; and the ſum of any uneven number of uneven numbers is an uneven number.

Primitive or prime numbers, are thoſe only diviſible by unity, as 5, 7, *&c.* And prime numbers among themſelves, are thoſe which have no common meaſure beſides unity, as 12 and 19.

Perfect number, that, whoſe aliquot parts added together, make the whole number, as 6, 28; the aliquot parts of 6 being 3, 2, and 1, = 6; and thoſe of 28, being 14, 7, 4, 2, 1, = 28.

Imperfect numbers, thoſe whoſe aliquot parts, added together, make either more or leſs than the whole. And theſe are diſtinguiſhed into abundant and defective; an inſtance in the former caſe is 12, whoſe aliquot parts 6, 4, 3, 2, 1, make 16; and in the latter caſe 16, whoſe aliquot parts 8, 4, 2, and 1, make but 15.

Plain number, that ariſing from the multiplication of two numbers, as 6, which is the product of 3 by 2; and theſe numbers are called the ſides of the plane.

Square number, is the product of any number multiplied by itſelf; thus 4, which is the factum of 2 by 2, is a ſquare number.

Every ſquare number added to its root makes an even number.

Polygonal, or polygonous numbers, the ſums of arithmetical progreſſions beginning with unity: theſe, where the common difference is 1, are called triangular numbers; where 2, ſquare numbers; where 3, pentagonal numbers; where 4, hexagonal numbers; where 5, heptagonal numbers, *&c.* See POLYGONAL.

Pyramidal numbers: the ſums of polygonous numbers, collected after the ſame manner as the polygons themſelves, and not gathered out of arithmetical progreſſions, are called firſt pyramidal numbers: the ſums of the firſt pyramidals are called ſecond pyramidals, *&c.*

If they ariſe out of triangular numbers, they are called triangular pyramidal numbers; if out of pentagons, firſt pentagonal pyramidals.

From the manner of ſumming up polygonal numbers, it is eaſy to conceive how the prime pyramidal numbers are found, *viz.* $\frac{(a-2)n^3+3n^2-(a-5)n}{6}$ expreſſes all the prime pyramidals.

Golden NUMBER, in chronology. See the article GOLDEN.

NUMBER, in grammar, a modification of nouns, verbs, *&c.* to accommodate them to the varieties in their objects, conſider-

ed with regard to number. See the articles NOUN and VERB.

Nouns or names agreeing to ſeveral things, may be conſidered either as applied to one of thoſe things ſingularly, or to a number of them; and thoſe conſidered either as ſeveral, or as united. To diſtinguiſh theſe caſes, two numbers have been invented, the ſingular and plural.

When a noun indicates an object conſidered as ſingle, or alone, or a number of them conſidered as united together, it is ſaid to be of the ſingular number, as a plant, an army, a church. When it indicates ſeveral objects, and thoſe as diſtinct, it is of the plural number, as plants, armies, churches: and when I ſpeak of myſelf as making a part of ſeveral others, inſtead of ſaying I, it is proper to ſay we, *&c.*

The Greeks have a third number which they call dual number, as ſignifying two: the Hebrews have ſomething like it; but then it only takes place when the words ſignify a thing double, either by nature, as the hands, eyes, *&c.* or by art, as ſciſſars, tongs, *&c.* As to common and appellative names, they ſeem all naturally to require a plural number, yet are there ſeveral which have none, as the name of gold, ſteel, *&c.*

The difference of numbers in nouns is expreſſed by a difference of termination. In Engliſh the ſingular is uſually converted into plural by adding s, as plant, plants; book, books, *&c.* Where the pronunciation requires it, as where the ſingular ends in s or x, ſh or ch, it is uſually done by the addition of es, inſtead of s. Very often the plural is formed by en, as from ox is formed the plural oxen; and from man, men; brother, brethren, *&c.* Thoſe nouns whoſe ſingulars end in f, or fe, form the plural by ves; as calf, calves; loaf, loaves; wife, wives, *&c.* However, the formation of the plural of many words can be reduced to no rule at all, being mere irregulars; as from mouſe is formed the plural mice; from foot, feet, *&c.* And in many words there is no difference of number; as in ſheep, deer, *&c.* Again, ſome words have no ſingular numbers; as aſhes, bellows, lungs, breeches, *&c.* and others no plural; as the names of countries, virtues and vices, metals, herbs, and corn. The plurals of adjectives, tho' varied from the ſingular in moſt languages, yet in engliſh are generally the ſame.

NUMBERS, in poetry, oratory, muſic, *&c.* are certain meaſures, proportions, or cadences, which render a verſe, period, or ſong, agreeable to the ear. See METRE.

Poetical numbers conſiſt in a certain harmony in the order, quantities, *&c.* of the feet and ſyllables; which make the piece muſical to the ear, and fit for ſinging, for which all the verſes of the antients were intended. See the articles MEASURE and RHYHME.

It is of theſe numbers Virgil ſpeaks in his ninth Eclogue, when he makes Lycidas ſay, *Numeros memini, ſi verba tenerem*; meaning, that although he had forgot the words of the verſes, yet he remembered the feet and meaſure of which they were compoſed.

Rhetorical, or proſaic numbers, are a ſort of ſimple unaffected harmony, leſs glaring than that of verſe, but ſuch as is perceived and affects the mind with pleaſure.

The numbers are that by which the ſtyle is ſaid to be eaſy, free, round, flowing, *&c.* Numbers are things abſolutely neceſſary in all writing, and even in all ſpeech. Hence Ariſtotle, Tully, Quintilian, *&c.* lay down abundance of rules as to the beſt manner of intermixing dactyles, ſpondees, anapeſts, *&c.* in order to have the numbers perfect. The ſubſtance of what they have ſaid, is reducible to what follows. 1. The ſtyle becomes numerous by the alternate diſpoſition and temperature of long and ſhort ſyllables, ſo as that the multitude of ſhort ones neither render it too haſty, nor that of long ones too ſlow and languid: ſometimes, indeed, long and ſhort ſyllables are thrown together deſignedly without any ſuch mixture, to paint the ſlowneſs or celerity of any thing by that of the numbers; as in theſe verſes of Virgil:

Illi inter ſeſe magna vi brachia tollunt;

and

Radit iter liquidum, celeres neque commovet alas.

2. The ſtyle becomes numerous by the intermixing words of one, two, or more ſyllables; whereas the too frequent repetition of monoſyllables renders the ſtyle pitiful and grating. 3. It contributes greatly to the numerouſneſs of a period to have it cloſed by magnificent and well ſounding words. 4. The numbers depend not only on the nobleneſs of the words in the cloſe, but of thoſe in the whole tenor of the period. 5. To have the period flow eaſily and equally; the

the harſh concurrence of letters and words is to be ſtudiouſly avoided, particularly the frequent meeting of rough conſonants; the beginning the firſt ſyllable of a word with the laſt of the preceding; the frequent repetition of the ſame letter or ſyllable; and the frequent uſe of the like ending words. Laſtly, the utmoſt care is to be taken left, in aiming at oratorial numbers, you ſhould fall into poetical ones; and inſtead of proſe, write verſe.

Book of NUMBERS, the fourth book of the Pentateuch, taking its denomination from its numbering the families of Iſrael.

A great part of this book is hiſtorical, relating to ſeveral remarkable paſſages in the Iſraelites march through the wilderneſs. It contains a diſtinct relation of their ſeveral movements from one place to another, or the two and forty ſtages through the wilderneſs, and many other things, whereby we are inſtructed and confirmed in ſome of the weightieſt truths that have immediate reference to God and his providence in the world. But the greateſt part of this book is ſpent in enumerating theſe laws and ordinances, whether civil or ceremonial, which were given by God, but not mentioned before in the preceding books.

NUMB-FISH, the ſame with the torpedo or cramp-fiſh. See the article TORPEDO.

NUMENIUS, in ornithology, a genus of birds of the order of the ſcolopaces; the beak of which is of a figure approaching to a cylindric one, it is obtuſe at the point, and is longer than the toes, the feet have each 4 toes connected together. This genus comprehends the curlew, the woodcock, the great plover, and the ſnipe. See the article CURLEW, *&c.*

NUMERAL LETTERS, thoſe letters of the alphabet which are generally uſed for figures, as I, V, X, L, C, D, M. See the article NUMERATION.

NUMERAL CHARACTERS. See the article CHARACTER.

NUMERALS, in grammar, thoſe words which expreſs numbers; as 6, 8, 10, *&c.*

NUMERATION, or NOTATION, in arithmetic, the art of expreſſing in characters any number propoſed in words; or of expreſſing in words any number propoſed in characters.

The characters uſed to expreſs numbers by, are either the ten numeral figures of the Arabians, *viz.*

one, two, three, four, five, ſix, ſeven, eight, nine, cypher;
1 2 3 4 5 6 7 8 9 0

Or the ſeven numeral letters of the Romans,

one,	five,	ten,	fifty,	hundred,	five-hundred,	thouſand.
I	V	X	L	C	D	M

Each of which figures, beſides their own ſingle value, receives ſeveral denominations according to their place and order. A number has ſo many places as there are figures in it, as 36487 is the number of five places. The order in whole numbers is from the right to the left. The value of places decreaſes in a decuple proportion: for every place to the left is ten times the value of the next place to the right. Each place alſo has its name; and thoſe names, for the more eaſy reading of large numbers, are diſtinguiſhed by periods, half-periods, *&c.*

For as a place / So a half-period / And a period } is { ten / a thouſand / a million } times the value of that before it.

A cypher is of itſelf inſignificant; but by its place alters the value of the ſubſequent figures: and, ſince the value of each place is ten times the value of the next before it, it is certain

that { 1 / 2 / 3 / *&c.* } in the firſt place, is { 10 / 20 / 30 / *&c.* } in the ſecond, { 100 / 200 / 300 / *&c.* } in the third, { 1000 / 2000 / 3000 / *&c.* } in the fourth, *&c.*

The value of each figure in any rank of numbers, how large ſoever, is readily found by the following rule.

Begin at units, ſet a point under the ſeventh place; then reckoning that as one, count forwards, and ſet another under the next ſeventh place, ſo continue to the end.

Then the { first, second, third, fourth, &c. } point from units ſtands under { millions, billions, trillions, quadrillions, &c.

As is evident in the following example,

Periods	Quadril.		Trillions		Billions		Millions		Units	
Half-periods	th.	units	th.	units	th.	units	th.	units	th.	units
Degrees	c x u	c x u	c x u	c x u	c x u	c x u	c x u	c x u	c x u	c x u
Figures	1 2 3	4 5 6	7 8 9	0 9 8	7 6 5	4 3 2	1 0 1	2 3 4	5 6 7	8 9 1

By this means you may have as clear a notion of, and may as eaſily read a number of ſeventy places as of ſeven.

NUMERATOR *of a fraction*. See the article FRACTION.

NUMERICAL, NUMEROUS, or NUMERAL, ſomething belonging to numbers; as numerical algebra is that which makes uſe of numbers inſtead of letters of the alphabet. Alſo, numerical difference, is the difference whereby one individual is diſtinguiſhed from another. Hence a thing is ſaid to be numerically the ſame, when it is ſo in the ſtricteſt ſenſe of the word. See the articles UNITY and IDENTITY.

NUMERO, in commerce. See the article BOOK OF NUMERO'S.

NUMIDIA, the antient name of Biledulgerid, in Africa. See BILEDULGERID.

NUMISMATOGRAPHIA, a term uſed for the deſcription and knowledge of antient medals and coins, whether of gold, ſilver, or braſs.

NUMMUS, or NUMUS, among the Romans, a piece of money otherwiſe called ſeſtertius. See MONEY and SESTERCE.

NUN, a woman, in ſeveral chriſtian countries, who devotes herſelf, in a cloiſter or nunnery, to a religious life. See the article MONK.

There were women in the antient chriſtian church, who made public profeſſion of virginity before the monaſtic life was known in the world, as appears from the writings of Cyprian and Tertullian. Theſe, for diſtinction's ſake, are ſometimes called eccleſiaſtical virgins, and were commonly enrolled in the canon or matricula of the church. They differed from the monaſtic virgin chiefly in this, that they lived privately in their father's houſes, whereas the others lived in communities: but their profeſſion of virginity was not ſo ſtrict as to make it criminal in them to marry afterwards, if they thought fit. As to the conſecration of virgins, it had ſome things peculiar in it: it was uſually performed publicly in the church by the biſhop. The virgin made a public profeſſion of her reſolution, and then the biſhop put upon her the accuſtomed habit of ſacred virgins. One part of this habit was a veil called the ſacrum velamen, another was a kind of mitre or coronet worn upon the head. At preſent, when a woman is to be made a nun, the habit, veil, and ring of the candidate are carried to the altar, and ſhe herſelf, accompanied by her neareſt relations, is conducted to the biſhop, who, after maſs and an anthem, the ſubject of which is, "that ſhe ought to have her lamp lighted, becauſe the bridegroom is coming to meet her," pronounces the benediction: then ſhe riſes up, and the biſhop conſecrates the new habit, ſprinkling it with holy-water. When the candidate has put on her religious habit, ſhe preſents herſelf before the biſhop, and ſings, on her knees, *ancilla Chriſti ſum*, &c. then ſhe receives the veil, and afterwards the ring, by which ſhe is married to Chriſt; and laſtly the crown of virginity. When ſhe is crowned, an anathema is denounced againſt all who ſhall attempt to make her break her vows. The ſeveral orders of nuns in the romiſh and greek churches, are mentioned under ſeparate articles.

NUNCIO, or NUNTIO, an embaſſador from the pope to ſome catholic prince or ſtate, or a perſon who attends on the pope's behalf at a congreſs, or an aſſembly of ſeveral embaſſadors.

The nuncio has a juriſdiction, and may delegate judges in all the ſtates where he reſides, except in France, where he has no authority but that of a ſimple embaſſador. See the article EMBASSADOR.

NUNCUPATIVE, in the ſchools, ſomething that is only nominal, or has no exiſtence but in name.

NUNCUPATIVE WILL, denotes a laſt will or teſtament, only made verbally, and not put in writing. See the articles WILL and TESTAMENT.

NUNDINAL, NUNDINALIS, a name which the Romans gave to the eight firſt letters of the alphabet, uſed in their calendar.

This ſeries of letters, A, B, C, D, E, F, G, H, is placed and repeated ſucceſſively from the firſt to the laſt day of the year: one of theſe always expreſſed the market-days, or the aſſemblies called nundinæ, *quaſi novendinæ*, becauſe they returned every nine days. The country people, after working eight days ſucceſſively, come to town the ninth, to ſell their ſeveral commodities, and to inform themſelves of what related to religion and government. Thus the nundinal day being under A on the firſt, ninth, ſeventeenth, and twenty-fifth days of January, &c. the letter D will be the nundinal letter of the year following. Theſe nundinals bear a very great reſemblance to the dominical letters, which return every eight days, as the nundinals did every nine. See DOMINICAL LETTER.

NUPER OBIIT, in law, a writ that lies for a ſiſter and coheir, who is deforced by her coparcener of lands, &c. of which their anceſtor died ſeiſed in fee. Here, if one ſiſter deforces another of land that is held in tail, the other ſiſter ſhall bring a formedon againſt her, and not this writ, &c. But a writ of rationabili parte lies where the anceſtor was once ſeiſed, yet died not ſeiſed of the poſſeſſion, but the reverſion.

NUPTIAL RITES, the ceremonies attending the ſolemnization of marriage, which are different in different ages and countries. See the article MARRIAGE.

The nuptial rites among the Jews are performed in the following manner. The bridegroom and bride are placed under a canopy, each of them covered with a black veil. The rabbin of the place, the chanter of the ſynagogue, or the neareſt relation of the huſband, takes a cup full of wine, and having pronounced a benediction, he preſents the cup to the bridegroom, and then to the bride, who juſt taſte of the liquor. Afterwards the bridegroom puts a ring upon the bride's finger, ſaying, "By "this ring thou art my ſpouſe, &c." Then they read the contract of marriage, which the bridegroom puts into the hands of the bride's relations: afterwards they rehearſe ſix bleſſings; the married couple drink wine, and the veſſel is thrown with violence againſt the ground, and broken in pieces. Before the deſtruction of the temple, the bridegroom and bride wore crowns on their heads, but ſince that time this cuſtom has ceaſed. In the ceremonies of marriage, the Hebrews pretend, that they imitate chiefly what was done at Tobias's wedding, which they look upon as a model of a regular and happy marriage. When the company are ſet down to ſupper, the bridegroom ſings a bleſſing in the Hebrew language: after ſupper they perform a dance, which they call the dance of the commandment, and before leading the bride into the marriage-chamber, they rehearſe a bleſſing.

Great part of the nuptial rites of the antient Greeks, conſiſted in offering ſacrifices to different deities, taking of omens, the parties taking one another by the hand, and kiſſing each other in token of fidelity, &c. For a further account of their ceremonies on this occaſion, ſee the articles BRIDE and BRIDEGROOM, &c. For an account of the marriage rites of the antient Romans, ſee CONFARREATION, EPITHALAMIUM, &c.

Among the antient chriſtians, the eſpouſing parties joined hands together. It was uſual to crown the bridegroom and bride with garlands, nor was it reckoned any harm to have a decent epithalamium. In the romiſh church, the prieſt is attended at the altar by two clerks, carrying the holy-water pot, the ſprinkler, and a little baſon to put the ring in. After a prayer, and aſking their mutual conſent, and joining their hands, he pronounces the formula, *Ego jungo vos*, &c. at the ſame time making the ſign of the croſs towards them, and ſprinkling them with holy-water; this done, he bleſſes the marriage-ring, and ſprinkling it with holy-water, after which he gives it to the bridegroom, who puts it on the bride's wedding-finger. Before conſummation, the prieſt uſually bleſſes the marriage-bed, by ſprinkling it with holy-water.

The nuptial ceremonies of our own church are too well known, and that of the ſeveral nations of the world too numerous to be inſerted here.

NURENBURG, the capital of a territory

tory of the ſame name, in the circle of Franconia, in Germany: eaſt long. 11°, north lat. 49° 30′.

NURSERY, in gardening, is a piece of land ſet apart for raiſing and propagating all ſorts of trees and plants, to ſupply the garden and other plantations. In a nurſery for fruit-trees, the following rules are to be obſerved: 1. That the ſoil ſhould not be better than that in which the trees are to be planted out for good. 2. That it ought to be freſh, and not ſuch as has been already worn out by trees, or other large growing plants. 3. It ought neither to be too wet, nor too dry, but rather of a middling nature; though, of the two extremes, dry is to be preferred; becauſe, though trees in ſuch a ſoil do not make ſo great a progreſs, yet they are generally ſounder, and more diſpoſed to fruitfulneſs. 4. It muſt be incloſed in ſuch a manner that neither cattle nor vermin may come in; and ſo as particularly to exclude hares and rabbits, which, when the ground is covered with ſnow, are great deſtroyers of young trees. 5. The ground being incloſed ſhould be carefully trenched about two feet deep; this ſhould be done in Auguſt, that it may be ready for receiving young ſtocks at the ſeaſon for planting, which is commonly about the beginning of October: in trenching the ground, you muſt be careful to cleanſe it from the roots of all noxious weeds. 6. The ſeaſon being come for planting, level down the trenches as equal as poſſible; and then lay out the ground into quarters, which may be laid out in beds for a ſeminary, in which you may ſow the ſeeds or ſtones of fruit. 7. And having provided yourſelf with ſtocks, the next year proceed to tranſplant them, in the following manner: draw a line acroſs the ground intended to be planted, and open a number of trenches exactly ſtraight; then take the ſtocks out of the ſeed-beds; in doing which, you ſhould raiſe the ground with a ſpade, in order to preſerve the roots as intire as poſſible; prune off the very ſmall fibres, and if there are any that have a tendency to root directly downwards, ſuch roots ſhould be ſhortened. Then plant them in the trenches, if they are deſigned for ſtandards, in rows three feet and a half, or four feet, from each other, and a foot and half diſtant in the rows; but if for dwarfs, three feet, row from row, and one foot in the row will be a ſufficient diſtance. Theſe plants ſhould by no means be headed, or pruned at top, which will weaken them, and cauſe them to produce lateral branches. If the winter ſhould prove very cold, lay ſome mulch on the ſurface of the ground near their roots, taking care not to let it lie too thick near the ſtems of the plants, and to remove it as ſoon as the froſt is over. In the ſummer-ſeaſon deſtroy the weeds, and dig up the ground every ſpring between the rows. The ſecond year after planting, ſuch of the ſtocks as are deſigned for dwarfs will be fit to bud; but thoſe that are deſigned for ſtandards ſhould be ſuffered to grow five or ſix feet high before they are budded or grafted; for the manner of doing which, ſee the articles INOCULATION and GRAFTING. As to timber-trees, Mr. Miller adviſes thoſe gentlemen who would have plantations in parks, woods, &c. to make nurſeries upon the ground intended for planting, where a ſufficient number of the trees may be left ſtanding, after the others have been drawn out to plant in other places.

The ground intended for the flower nurſery ſhould be well ſituated to the ſun; and defended from ſtrong winds by plantations of trees or buildings. The ſoil alſo ſhould be light and dry, eſpecially for bulbous-rooted flowers; for in this nurſery the off-ſets of all bulbous-rooted flowers ſhould be planted, and remain there till they become blowing roots, when they ſhould be removed into the pleaſure-garden, and planted either in beds or borders, according to the goodneſs of the flowers. Theſe flowers may alſo be raiſed in the nurſery from ſeed. The ſeedling auriculas polyanthuſes, ranunculuſes, anemonies, carnations, &c. ſhould be raiſed in this nurſery, where they ſhould be preſerved till they have flowered, when all thoſe ſhould be marked that are worthy of being tranſplanted into the flower-garden; this ſhould be done in their proper ſeaſons: for all theſe ſeedling flowers ought not indiſcriminately to be expoſed to public view in the pleaſure-garden, becauſe it always happens, that there are great numbers of ordinary flowers produced among them, which will there make but an indifferent appearance.

NUSANCE, in law, a thing done to the annoyance of another.

Nuſances

Nuſances are either public or private: a public nuſance is an offence againſt the public in general, either by doing what tends to the annoyance of all the king's ſubjects, or by neglecting to do what the common good requires: in which caſe all annoyances and injuries to ſtreets, highways, bridges, and large rivers; as alſo diſorderly ale-houſes, bawdy-houſes, gaming houſes, ſtages for rope-dancers, &c. are held to be common nuſances. A private nuſance is when only one perſon or family is annoyed, by the doing of any thing; as where a perſon ſtops up the light of another's houſe, or builds in ſuch a manner that the rain falls from his houſe upon his neighbour's; as likewiſe the turning or diverting water from running to a man's houſe, mill, meadow, &c. ſtopping up a way that leads from houſes to lands; ſuffering a houſe to decay, to the damage of the next houſe; erecting a brew-houſe in any place not convenient; or an houſe of office, &c. ſo near another perſon's houſe as to offend him by its ſmell.

Indictment lies for a public or common nuſance at the king's ſuit, whereon the party offending ſhall be fined and impriſoned; but no action can be brought in this caſe except one man ſuffers more by a common nuſance than another; as where a pit is dug in the high-way, and he falls into it. Action on the caſe, or aſſiſe of nuſance, lies, for any private nuſance, at the ſuit of the party aggrieved, and on ſuch actions judgment is given that the nuſance ſhall be removed, and the injured party recover damages: but if a perſon has only a term of years in a houſe or lands, as he has no freehold therein, he can only have an action on the caſe, by which the nuſance will be removed without his recovering damages. The continuation of a nuſance, is by the law conſidered as a new nuſance, and therefore where a perſon ſuffers a nuſance to be ſet up, and then alienates or leſſee, for continuing it. It has been adjudged that any perſon may remove a nuſance, in which caſe, even the cutting down a gate that croſſes the highway is legal; yet if a man deſtroys the nuſance himſelf, before he commences his action, he cannot have it afterwards, nor recover damages. Neither the lord of a manor, nor the king himſelf, can licence any perſon to make or erect a nuſance.

NUT, *nux*, among botaniſts, denotes a pericarpium of an extraordinary hardneſs, incloſing a kernel or ſeed.

Of theſe there are ſeveral kinds, as filberts, walnuts, &c. See the articles FILBERT, WALNUT, &c.

The word nut makes part of the engliſh names of ſeveral plants, as the bladder-nut, or ſtaphylæa; the earth-nut; the malabar-nut; the peaſe-nut; the phyſic-nut; the ſpaniſh-nut, &c. See the article STAPHYLÆA, &c.

NUT-HATCH, *ſitta*, in ornithology. See the article SITTA.

NUTATION, in aſtronomy, a kind of tremulous motion of the axis of the earth, whereby, in each annual revolution, it is twice inclined to the ecliptic, and as often returns to its former poſition. See EARTH and INCLINATION.

Sir Iſaac Newton obſerves, that the moon has the like motion, only very ſmall, and ſcarce ſenſible.

NUTMEG, *nux moſchata*, in natural hiſtory, the kernel of a large fruit, not unlike the peach, the produce of a tree called by botaniſts myriſtica. See the article MYRISTICA.

The nutmeg is ſeparated from its inveſtient coat, the mace, before it is ſent over to us; except that the whole fruit is ſometimes imported in preſerve, by way of ſweetmeat, or as a curioſity. See the article MACE.

The nutmeg, as we receive it, is of a roundiſh or oval figure, of a tolerably compact and firm texture, but eaſily cut with a knife, and falling to pieces on a ſmart blow. Its ſurface is not ſmooth, but furrowed with a number of wrinkles, running in various directions, though principally longitudinally. It is of a greyiſh brown colour on the outſide, and of a beautiful variegated hue within, being marbled with brown and yellow variegations, running in perfect irregularity through its whole ſubſtance. It is very unctuous and fatty to the touch, when powdered, and is of an extremely agreeable ſmell, and of an aromatic taſte, without the heat that attends that kind of flavour in moſt of the other ſpecies.

There are two kinds of nutmeg in the ſhops, the one called by authors the male, and the other the female. The female is the kind in common uſe, and is of the ſhape

ſhape of an olive: the male is long and cylindric, and has leſs of the fine aromatic flavour than the other, ſo that it is much leſs eſteemed, and people who trade largely in nutmegs will ſeldom buy it. Beſides this oblong kind of nutmegs, we ſometimes meet with others of perfectly irregular figures, but mere luſus naturæ, not owing to a different ſpecies of the tree. The longer male nutmeg, as we term it, is called by the Dutch the wild nutmeg. It is always diſtinguiſhable from the others, as well by its want of fragrancy, as by its ſhape: it is very ſubject to be worm-eaten, and is ſtrictly forbid, by the Dutch, to be packed up among the other, becauſe it will give occaſion to their being worm-eaten too, by the inſects geting from it into them, and breeding in all parts of the parcel.

The largeſt, heavieſt, and moſt unctuous of the nutmegs are to be choſen, ſuch as are of the ſhape of an olive, and of the moſt fragrant ſmell. The Dutch import them from the Eaſt-Indies.

Nutmeg is greatly uſed in our foods, and is of excellent virtues as a medicine; it is a good ſtomachic, it promotes digeſtion, and ſtrengthens the ſtomach. It alſo ſtops vomiting; is an excellent remedy in flatuſes; and is happily joined with rhubarb, and other medicines, in diarrhœas. It is obſerved to have a ſoporific virtue, and to exert it too ſtrongly, if taken in immoderate quantities. It has a conſiderable degree of aſtringency; and given after toaſting before the fire, till thoroughly dry and crumbly, it has been ſometimes known alone to cure diarrhœas.

Nutmegs on being imported, pay a duty of 1 s. 6 d. $\frac{38\frac{5}{8}}{100}$ d. and draw back, on exportation, 1 s. $4\frac{33\frac{1}{2}}{100}$ d.

NUTRITION, in the animal œconomy, is the repairing the continual loſs, which the different parts of the body undergo.

The motion of the parts of the body, the friction of theſe parts with each other, and eſpecially the action of the air, would deſtroy the body entirely, if the loſs was not repaired by a proper diet, containing nutritive juices; which being digeſted in the ſtomach, and afterwards converted into chyle, mix with the blood, and are diſtributed through the whole body for its nutrition. See the articles DIET, DIGESTION, CHYLE, &c.

In young perſons, the nutritive juices not only ſerve to repair the parts that are damaged, but alſo to encreaſe them, which is called growth.

In grown perſons, the cuticle is every where conſtantly deſquamating, and again renewing; and in the ſame manner the parts rubbed off, or otherwiſe ſeparated from the fleſhy parts of the body, are ſoon ſupplied with new fleſh; a wound heals, and an emaciated perſon grows plump and fat. See the article CORPULENCY.

Buffon, in order to account for nutrition, ſuppoſes the body of an animal, or vegetable, to be a kind of mould, in which the matter neceſſary to its nutrition is modeled and aſſimilated to the whole. But, continues he, of what nature is this matter, which an animal, or vegetable, aſſimilates to its own ſubſtance? What power is it that communicates to this matter the activity and motion neceſſary to penetrate this mould? and, if ſuch a force exiſt, would it not be by a ſimilar force that the internal mould itſelf might be reproduced?

As to the firſt queſtion, he ſhews, that there exiſts in nature an infinite number of living organical parts, and that all organized bodies conſiſt of ſuch organical parts; that their production coſts nature nothing, ſince their exiſtence is conſtant and invariable; ſo that the matter which the animal, or vegetable, aſſimilates to its ſubſtance, is an organical matter, of the ſame nature with that of the animal, or vegetable, which conſequently may augment its volume, without changing its form, or altering the quality of the ſubſtance in the mould.

As to the ſecond queſtion: there exiſt, ſays he, in nature, certain powers, as that of gravity, that have no affinity with the external qualities of the body, but act upon the moſt intimate parts, and penetrate them throughout, and which can never fall under the obſervation of our ſenſes.

And, as to the third queſtion, he anſwers, that the internal mould itſelf is reproduced, not only by a ſimilar power, but it is plain that it is the very ſame power that cauſes the unfolding and reproduction thereof: for it is ſufficient, proceeds he, that, in an organized body that unfolds itſelf, there be ſome part ſimilar to the whole, in order that this part

part may one day become itſelf an organized body, altogether like that of which it is actually a part.

Defect of NUTRITION, or ATROPHY, in medicine. See ATROPHY.

NUTRITION, in pharmacy, a kind of preparation, conſiſting in the gradual mixture of liquors of different natures, by ſtirring them together till they have acquired a thick conſiſtence, as in making butter of ſaturn, *&c.*

NUTTUNO, or NETTUNO. See the article NETTUNO.

NUX, the WALNUT-TREE, in botany. See the article JUGLANS.

NUX CUPRESSI, CYPRESS-NUT, a fruit improperly ſo called, as not at all of the nut-kind, is accounted a very powerful aſtringent and balſamic, ſcarce any ſimple medicine being preferable to it in diarrhœas and dyſenteries. It is alſo ſaid to be a very good febrifuge.

NUX MOSCHATA. See NUTMEG.

NUX PISTACHIA. See PISTACHIA.

NUX VOMICA. See NUX VOMICA.

NUYS, a town of Germany, twenty miles north of Cologn.

NYBURG, a town of Denmark, ſituated at the eaſt-end of the iſland of Funen, ten miles eaſt of Odenſee: eaſt long. 10°, north lat. 55° 30′.

NYCHTHEMERON, νυχθημερον, the natural day, or day and night, which together always make twenty-four hours. See the articles DAY and NIGHT.

NYCTALOPIA, in medicine, a two-fold diſorder of the eye, one of which is oppoſite to the other. In the firſt, the ſight is beſt in the night, and in obſcure places; whereas, in a clear light, their ſight fails, ſo that they can hardly ſee any thing. In the other ſort of nyctalopia, the patient can ſee nothing at all except in a clear and bright light.

As theſe infirmities ariſe from a natural bad formation of the eye; they are therefore incurable.

NYCTANTHES, *Arabian* JASMINE, in botany, a genus of the diandria-monogynia claſs of plants, the flower of which conſiſts of a ſingle ſaucer-like petal, with the limb divided into eight oblong ſegments: the fruit is a didymous, bilocular berry, with a large roundiſh ſeed in each cell.

NYCTICORAX, a bird of the heron-kind, called in engliſh the night-raven; by reaſon it flies chiefly in the night-time, and makes a very diſagreeable croaking.

NYLAND, a province of Finland, ſituated on the gulph of Finland, weſt of the province of Carelia.

NYMPH, in mythology, an appellation given to certain inferior goddeſſes inhabiting the mountains, woods, waters, *&c.* ſaid to be the daughters of Oceanus and Tethys. All the univerſe was repreſented as full of theſe nymphs, which are diſtinguiſhed into ſeveral ranks or claſſes. The general diviſion of them is into celeſtial and terreſtrial; the former of which were called Uraniæ, and were ſuppoſed to be intelligences that governed the heavenly bodies or ſpheres. The terreſtrial nymphs called Epigeiæ, preſided over the ſeveral parts of the inferior world, and were divided into thoſe of the water, and thoſe of the earth. The nymphs of the water were the oceanitides, or nymphs of the ocean; the nereids, the nymphs of the ſea; the naiads and ephydriades, the nymphs of the fountains: and the limniades, or nymphs of the lakes. The nymphs of the earth were the oreades, or nymphs of the mountains; the napœæ, nymphs of the meadows; and the dryads and hamadryads, who were nymphs of the foreſts and woods. Beſides theſe, we meet with nymphs who took their names from particular counties, rivers, *&c.* as the cithæroniades, ſo called from mount Cithæron in Bœotia; the dodonides, from Dodona; the tiberiades, from the Tiber, *&c.*

Goats were ſometimes ſacrificed to the nymphs; but their conſtant offerings were milk, oil, honey and wine.

NYMPH, among naturaliſts, that ſtate of winged-inſects between their living in the form of a worm, and their appearing in the winged or moſt perfect ſtate.

The eggs of inſects are firſt hatched into a kind of worms, or maggots; which afterwards paſs into the nymph-ſtate, ſurrounded with ſhells or caſes of their own ſkins: ſo that, in reality, theſe nymphs are only the embryo-inſects, wrapped up in this covering; from whence they at laſt get looſe, though not without great difficulty.

During the nymph-ſtate, the creature loſes its motion. Swammerdam calls it nympha aurelia, or ſimply aurelia; and others give it the name of chryſalis, a term of the like import. See the article CHRYSALIS.

NYMPHÆ, in anatomy, two membranaceous parts, ſituated on each ſide the

rima. They are of a red colour and cavernous ſtructure, ſomewhat reſembling the wattles under a cock's throat. They are ſometimes ſmaller, ſometimes larger, and are continuous to the præputium of the clitoris, and joined to the interior ſide of the labia.

The nymphæ are full of nervous papillæ, whence their quick ſenſe: they have alſo ſmall glands, that ſecrete a fatty matter. Their uſe ſeems to be to increaſe the pleaſure in coition, and to direct the courſe of the urine.

The nymphæ are ſometimes ſo large, as not only to hang without the labia pudendi; but alſo to prove very troubleſome to the woman in walking, ſitting, and in conjugal embraces, ſo as to require the ſurgeon's aſſiſtance.

When this is the caſe the patient being laid in a proper poſture, the ſurgeon ſhould take hold of the nymphæ with his left-hand, and with a pair of ſciſſars in his right-hand, cut off ſo much of them as is judged neceſſary; taking care to have ſtyptics in readineſs to ſtop the hæmorrhage, and cordial medicines to prevent the patient from fainting. The wound is to be dreſſed with ſome vulnerary balſam, and healed in the common method. See the article WOUND.

This operation is rarely found neceſſary in our parts of the world, but is frequently practiſed in the eaſt; being properly the circumciſion of women. See the article CIRCUMCISION.

NYMPHÆA, the WATER-LILY, in botany, a genus of the polyandria-monogynia claſs of plants, the flower of which conſiſts of a number of petals, uſually fifteen: they are ſmaller than the cup, and are inſerted into the ſide of the germen in more than a ſingle ſeries: the fruit is an oval fleſhy berry, containing a great many roundiſh ſeeds.

The root of this plant was recommended by the antients, as an aſtringent for internal uſe, and as a ſtyptic to ſtop the bleeding of wounds, or other hæmorrhages. At preſent, it is not much known in the ſhops; but the common people uſe it internally for the fluor albus in women, and for gleets and ſeminal weakneſſes in men.

NYMPHEUM, in antiquity, a public hall, magnificently decorated, for entertainment, &c. and where thoſe, who wanted convenience at home, held their marriage-feaſts; whence the name.

NYMPHOMANIA, in medicine, the ſame with furor uterinus. See FUROR.

NYMPHOTOMIA, in ſurgery, the operation of cutting the nymphæ, when too large. See the article NYMPHÆ.

NYONS, a town of Dauphine, in France: eaſt long. 5° 6′, north lat. 44° 28′.

NYSLOT, a town of Sweden, in the province of Finland, ſixty miles north of Wyburg: eaſt long. 29°, north lat. 62°.

NYSSA, in botany, a genus of the dioecia decandria claſs of plants, the flower of which is divided into five ſegments: the ſtyle is ſingle; and the fruit is a drupe, containing only one cell, with a ſingle nut. It is a native of Virginia.

O.

O, or o, the fourteenth letter, and fourth vowel of our alphabet, pronounced as in the words *noſe*, *roſe*, &c.

The ſound of this letter is often ſo ſoft, as to require it double, and that chiefly in the middle of words; as *gooſe*, *reproof*, &c. and in ſome words this *oo* is pronounced like *u* ſhort, as in *flood*, *blood*, &c.

As a numeral, O is ſometimes uſed for eleven; and with a daſh over it, thus $\overline{O}$, for eleven thouſand.

In the notes of the antients, O. CON. is read *opus conductum*; O. C. Q. *opera conſilioque*; O. D. M. *operæ, donum, munus*; and O. LO. *opus locatum*.

In muſic, the O, or rather a circle, or double CO, is a note of time, called by us a ſemi-breve; and, by the Italians, circolo. The O is alſo uſed as a mark of triple time, as being the moſt perfect

perfect of all figures. See TRIPLE.

OAK, *quercus*, in botany, a genus of the monoecia-polyandria claſs of plants, without any flower-petals; the ſtamina are from five to ten in number: the cup of the female flower is formed of a ſingle, coriaceous leaf, undivided at the edge, and rough: the ſtyles are from two to five: the ſeed is ſingle, large and oval. For the galls of the oak. See GALLS.

Oak-timber is one of the principal materials in building; and being ſtrong in all poſitions, may be truſted in croſs and tranſverſe-work, as for ſummers, beams, *&c.*

OAK *of Jeruſalem*, in botany, a name given to chenopodium. See the article CHENOPODIUM.

Poiſon OAK. See TOXICODENDRUM.

OAKAM, old ropes untwiſted, and pulled out into looſe hemp, in order to be uſed in caulking the ſeams, tree-nails and bends of a ſhip, for ſtopping or preventing leaks.

OAKHAMPTON, a borough of Devonſhire, twenty miles weſt of Exeter, which ſends two members to parliament.

OAR, in navigation, a long piece of wood, made round where it is to be held in the hand, and thin and broad at the other end, for the eaſier cutting and reſiſting the water, and conſequently moving the veſſel, by rowing. Oars for ſhips are generally cut out of fir-timber, thoſe for barges are made out of New-England, or Dantzick-rafters, and thoſe for boats, either out of engliſh-aſh, or fir-rafters from Norway.

OAT, *avena*, in botany, a genus of the triandria-digynia claſs of plants, the corolla of which conſiſts of two valves; the nectaria are two; from the back of the corolla, there grows a ſingle, crooked, and contorted ariſta, or awn: the corolla ſerves as a pericarpium, ſurrounding a ſingle ſeed, which is of an oblong figure, very ſharp-pointed at each end, and with a longitudinal furrow.

Some phyſicians have recommended a diet-drink made of oats, in various diſtempers. The method of preparing it is as follows: Take of freſh oats entire, and well waſhed, one pound and a half; of the freſh root of ſuccory, cut into ſlices, one handful; of ſpring-water, twelve pints; boil all together in an earthen veſſel, till half is conſumed; then ſtrain the liquor through a linen cloth, and add to it ſix ounces of coarſe ſugar, and half an ounce of ſal prunellæ; let it boil again, then ſet it by for a day and a night in a cool place; laſtly, pour off the clear liquor, and keep it in a cellar in veſſels cloſe ſtopped.

Two ordinary cups of this liquor given twice a day, three hours before, and as many after dinner, are ſaid to do wonders in the cure of all kinds of fevers, colic-pains, pleuriſies, the itch, cutaneous tumours, and hypochondrical diſorders; as alſo in cleanſing the kidneys from ſand, and opening the obſtructed viſcera. The uſe of it is to be continued thirteen days.

OATH, *juſjurandum*, is a ſolemn affirmation in which the perſons ſworn invoke the almighty to witneſs that their teſtimony is true, renouncing all claim to his mercy, and calling for his vengeance if it be falſe: on which account ſuch an oath is termed ſacramentum, a holy band, or tie; and it is alſo called a corporal oath, becauſe the perſon who takes it, lays his right-hand on the book of the Evangeliſts. All oaths muſt be adminiſtered by a perſon duly authorized, and in order to diſcover truth and right; and therefore, if a perſon not duly authorized, adminiſters an oath, he is puniſhable both with fine and impriſonment. A perſon who is to be a witneſs in a cauſe may have two oaths adminiſtered to him; the one to ſpeak the truth, in relation to what the court ſhall think fit to aſk him, concerning himſelf or any thing elſe that is not evidence in the cauſe; and the other purely to give evidence in the cauſe wherein he is produced as a witneſs; the former of which is called an oath upon a voyer dire. By ſtatute, all that bear offices of any kind under the government, members of the houſe of commons, eccleſiaſtical perſons, members of colleges, ſchool-maſters, ſerjeants at law, counſellors, attornies, ſolicitors, advocates, proctors, *&c.* are required to take the oaths of allegiance, ſupremacy, and abjuration; all perſons neglecting, or refuſing to take theſe oaths are declared to be incapable of executing their offices and employments, of ſuing at law, of being guardians, executors, *&c.* and are liable to the forfeiture of 500 l. 13 W. III. c. 6. 1 Ann. c. 22. and 1 Geo. I. c. 13.

OBDACH, a town of Germany, in the circle of Auſtria and dutchy of Stiria, thirty-five miles weſt of Gratz.

OBADIAH, or *the prophecy of* OBADIAH, a canonical book of the Old Teſtament, which is contained in one ſingle chapter,

and is partly an invective againſt the cruelty of the Edomites, who mocked and derided the children of Iſrael, as they paſſed into captivity, and with other enemies, their confederates, invaded and oppreſſed thoſe ſtrangers, and divided the ſpoil amongſt themſelves: and partly a prediction of the deliverance of Iſrael, and of the victory and triumph of the whole church over her enemies.

OBEDIENCE, or OBEDIENTIA, in the canon-law, is ſometimes uſed for an office, or the adminiſtration of it. In our antient cuſtoms obedientia was uſed, in the general, for every thing that was enjoined the monks by the abbots; and in a more limited ſenſe it was applied to the farm belonging to the abbey, to which the monks were ſent vi ejuſdem obedientiæ, either to look after the farm, or collect the rents. Hence, theſe rents themſelves were alſo called obedientiæ.

OBELISK, in architecture, a truncated, quadrangular, and ſlender pyramid, raiſed as an ornament, and frequently charged either with inſcriptions or hieroglyphics.

Obeliſks appear to be of very great antiquity, and to be firſt raiſed to tranſmit to poſterity precepts of philoſophy, which were cut in hieroglyphical characters: afterwards they were uſed to immortalize the great actions of heroes, and the memory of perſons beloved. The firſt obeliſk mentioned in hiſtory was that of Rameſes king of Egypt, in the time of the Trojan war, which was forty cubits high. Phius, another king of Egypt, raiſed one of forty-five cubits; and Ptolemy Philadelphus, another of eighty-eight cubits, in memory of Arſinoe. Auguſtus erected one at Rome in the Campus Martius, which ſerved to mark the hours on an horizontal dial, drawn on the pavement. They were called by the Egyptian prieſts the fingers of the ſun, becauſe they were made in Egypt alſo, to ſerve as ſtyles, or gnomons to mark the hours on the ground. The Arabs ſtill call them Pharaoh's needles, whence the Italians call them aguglia, and the French aiguilles.

The proportions in the height and thickneſs are nearly the ſame in all obeliſks; their height being nine, or nine and a half, and ſometimes ten times their thickneſs; and their diameter at the top never leſs than half, and never greater than three fourths of that at the bottom.

OBELISK, †, in grammar, a mark in form of a dagger, uſed to refer the reader to a note in the margin, at the ſide or bottom of a page.

OBERNSBERG, a town of Germany, in the circle of Bavaria, fifteen miles ſouth of Paſſau.

OBERSTEIN, the capital of the county of the ſame name, in the Palatinate of the Rhine, thirty miles eaſt of Triers.

OBERWESEL, or WESEL, a town of Germany, in the electorate of Triers, thirty-ſeven miles north-eaſt of the city of Triers.

OBJECT, in philoſophy, ſomething apprehended, or preſented to the mind, by ſenſation or by imagination.

Chauvinus defines an object to be that about which a power, act, or habit is employed: thus, good is the object of the will, truth of the underſtanding; and, in like manner, colour is the object of ſight, ſound of hearing, &c.

Objects are uſually divided into next, *proxima*, which are thoſe the power or habit is immediately employed on; in which ſenſe, colour is the next object of ſight: and remote, which are thoſe only perceived by means of the former; in which ſenſe the wall is the remote object of ſight, ſince we only ſee it by means of its colour, &c. Ideas are the immediate objects of the mind, in thinking; bodies, their relations, attributes, &c. are the mediate objects. Hence it appears, that there is a ſort of ſubordination of objects. But let it be obſerved that a next object with regard to a remote one, is properly a ſubject, not an object. See the article SUBJECT.

The ſchools alſo diſtinguiſh objects *per ſe*, being properly ſuch as move or affect our ſenſes; ſuch are the ſenſible qualities: and objects *per accidens*, which are ſubſtances, and only affect us by being inveſted with ſenſible qualities. Again, they diſtinguiſh between common objects, ſuch as affect divers ſenſes, as motion, figure, &c. and proper objects, which affect only one ſenſe.

Object is alſo uſed for the matter of an art or ſcience, or that about which it is employed; in which ſenſe, it alſo coincides with ſubject.

The ſchools diſtinguiſh divers kinds of objects in the ſame ſcience, as material object, formal object, objectum quod complexum, objectum quod incomplexum, &c.

OBJECT GLASS *of a teleſcope, or microſcope*, the

the glaſs placed at the end of the tube which is next the object. See the articles TELESCOPE and MICROSCOPE.

OBJECTION, ſomething urged to overthrow a poſition, or a difficulty raiſed againſt an allegation, or propoſition of a perſon we are diſputing withal.

OBJECTIVE is uſed, in the ſchools, in ſpeaking of a thing which exiſts no otherwiſe, than as an object known. The exiſtence of ſuch a thing is ſaid to be objective.

This word is alſo uſed for the power, or faculty, by which any thing becomes intelligible; and for the act itſelf, whereby any thing is preſented to the mind and known.

OBIT, among chriſtians, a funeral ſolemnity, or office for the dead, moſt commonly performed when the corpſe lies in the church uninterred.

It likewiſe ſignifies the anniverſary office, or annual commemoration of the dead, performed yearly on the day of their death, with prayers, alms, *&c.* In religious houſes they have a regiſter, in which they enter the obits of their founders, or benefactors, which is thence termed the obituary.

OBLATI, in church-hiſtory, were ſecular perſons, who devoted themſelves and their eſtates to ſome monaſtery, into which they were admitted as a kind of lay-brothers. The form of their admiſſion, was, putting the bell-ropes of the church round their necks, as a mark of ſervitude. They wore a religious habit, but different from that of the monks.

Oblati, in France, were a kind of lay-monks, antiently placed by the king in all the abbeys and priories belonging to the crown; to whom the religious were obliged to give a monk's allowance, on account of their ringing the bells, ſweeping the church, *&c.* Theſe places were uſually filled with lame ſoldiers, ſome of whom had penſions without performing any duty. But theſe oblati with their penſions, have ſince been removed to the hôtel of the invalids at Paris.

OBLATION, a ſacrifice, or offering made to God. See the article SACRIFICE.

In the canon-law, oblations are defined to be any thing offered by godly chriſtians to God and the church, whether moveables or immoveables. There were antiently ſeveral kinds of thoſe, as oblationes altaris, which were given to the prieſt for ſaying maſs: oblationes defunctorum, given by the laſt will of the deceaſed, to the church: oblationes mortuorum, thoſe given by the relations of the dead at their burials; oblationes pœnitentium, thoſe given by penitents; and oblationes pentecoſtales, or whitſuntide-offerings. Till the fourth century, the church had no fixed revenues, the clergy wholly ſubſiſting on voluntary oblations. Oblations are now in the nature of tythes, and recoverable in the eccleſiaſtical courts.

OBLIGATION, in general, denotes any act whereby a perſon becomes bound to another, to do ſomething; as to pay a ſum of money, be ſurety, or the like.

Obligations are of three kinds, *viz.* natural, civil, and mixed. Natural obligations are entirely founded on natural equity; civil obligation, on civil authority alone, without any foundation in natural equity; and mixed obligations are thoſe which being founded on natural equity, are further enforced by civil authority.

In a legal ſenſe, obligation ſignifies a bond, wherein is contained a penalty, with a condition annexed for the payment of money, *&c.* The difference between it and a bill is, that the latter is generally without a penalty or condition, though it may be made obligatory: and obligations are ſometimes by matter of record, as ſtatutes and recognizances. See the article BOND.

OBLIQUATION, or *Cathetus of* OBLIQUATION. See CATHETUS.

OBLIQUE, in geometry, ſomething aſlant, or that deviates from the perpendicular. Thus an oblique angle, is either an acute or obtuſe one, *i. e.* any angle except a right one. See the article ANGLE.

OBLIQUE ASCENSION, in aſtronomy. See the article ASCENSION.

OBLIQUE CASES, in grammar, are all the caſes except the nominative. See CASE.

OBLIQUE DESCENSION, in aſtronomy. See the article DESCENSION.

OBLIQUE LINE, that which, falling on another line, makes oblique angles with it, *viz.* one acute, and the other obtuſe.

OBLIQUE PERCUSSION, in mechanics. See the article PERCUSSION.

OBLIQUE PLANES, in dialling, are thoſe which recline from the zenith, or incline towards the horizon. See the articles DIAL and PLANE.

The obliquity, or quantity of this inclination, or reclination, may be found by means of a quadrant,

OBLIQUE SAILING, in navigation, is when a ſhip ſails upon ſome rhumb between the four cardinal points, making an oblique angle with the meridian; in which caſe, ſhe continually changes both latitude and longitude.

Oblique ſailing is of three kinds, *viz.* plain-ſailing, mercator's ſailing, and great circle-ſailing. See the article NAVIGATION.

OBLIQUE SPHERE, is where the pole is elevated any number of degrees leſs than 90°; in which caſe, the axis of the world, the equator, and parallels of declination will cut the horizon obliquely. See the article SPHERE.

OBLIQUITY *of the ecliptic.* See the article ECLIPTIC.

OBLIQUUS, in anatomy, oblique, a name given to ſeveral muſcles, particularly in the head, eyes, and abdomen. For the oblique muſcles of the head, ſee the article FRONTAL MUSCLES.

The oblique muſcles of the eye, called alſo rotatores, are two, a larger and a ſmaller. The firſt, which is alſo called obliquus ſuperior, and trochlearis, the greater, upper, or trochlear oblique muſcle of the eye, has its origin near the recti, and paſſes through a ſingular trochlea, of an almoſt cartilaginous ſtructure, near the large canthus of the eye: from thence it again turns back, and is inſerted into the upper part of the eye, near its middle: hence it obliquely depreſſes the pupil, and in ſome degree draws it outwards. The obliquus minor, the leſſer oblique muſcle of the eye, ariſes from the anterior and inner part of the orbit, not far from the naſal canal: it ſurrounds obliquely the lower part of the bulb, and is inſerted into its exterior part, near the middle. Hence it moves the pupil of the eye obliquely upwards; but both theſe muſcles acting together, draw it forwards, and thus they are the antagoniſts of the recti, which draw it backwards.

The oblique muſcle of the ear, called alſo by ſome the ſemi-circularis, is one of the three muſcles of the malleus, and is ſituated in the external and boney part of the ductus Euſtachii; from whence paſſing a little upwards, and backwards through the canal, it is inſerted into the largeſt proceſs of the malleus, and ſerves to relax and ſtraiten, in various degrees, the membrane of the tympanum.

The oblique aſcendents are, a pair of muſcles of the abdomen, that ariſe from the fifth rib to the eleventh, and terminate, by their aponeuroſes, in the ſpine of the ileum, the os pubis, and the linea alba; however, ſeveral fibres paſs thro' them. The oblique aſcendants, are a pair of muſcles that ariſe from the oſſa ilei, the os ſacrum, and the ſpines of the loins; and are inſerted partly in the lower ſide of the ſpurious ribs, and partly in the linea alba. There is an annulus or ring in the lower part of the oblique deſcendents; and a perforation in the oblique aſcendents, ſerving for giving paſſage to proceſſes of the peritonæum, and the ſpermatic veſſels in men, and to the ligamentum rotonda of the uterus in women.

OBLONG, in general, denotes a figure that is longer than broad: ſuch is a parallelogram, ellipſis, &c. See the article PARALLELOGRAM and ELLIPSIS.

OBLONGATA MEDULLA, in anatomy. See MEDULLA and BRAIN.

OBOLUS, in antiquity, an antient athenian coin. See the article COIN.

Among antient phyſicians, obolus likewiſe denoted a weight, equal to ten grains. See the article WEIGHT.

OBREPTITIOUS, an appellation given to letters patent, or other inſtruments, obtained of a ſuperior by ſurprize: or, by concealing from him the truth.

OBSCURA CAMERA. See CAMERA.

OBSCURE, ſomething that is dark and reflects little light, or that is not clear and intelligible.

Obſcurity, in this laſt ſenſe, ariſes from hence, that we do not conceive and expreſs things as they are, but as we judge them to be, ere we have fully examined them. See the articles KNOWLEDGE, LANGUAGE, WORD, &c.

OBSCURO, or CLARO OBSCURO. See the article CLARO-OBSCURO.

OBSECRATION, in rhetoric, a figure whereby the orator implores the aſſiſtance of God, or man. Such is that of Palinurus, Æn. vi. v. 363, ſeq.

Quod te per coeli jucundum lumen & auras,
Per genitorem oro, per ſpem ſurgentis Iuli;
Eripe me his, invicte, malis: &c.

OBSEQUIES, the ſame with funeral ſolemnities. See the articles BURIAL, FUNERAL, &c.

OBSERVANCE, in a monaſtic ſenſe, denotes a community of religious, tied to the perpetual obſervation of the ſame rule.

OBSERVATION, among navigators, ſignifies the taking the ſun's, or the ſtar's meridian

meridian altitude, in order thereby to find the latitude. See LATITUDE.

Celeſtial OBSERVATIONS. See CELESTIAL, and the following article.

OBSERVATORY, a place deſtined for obſerving the heavenly bodies; being, generally, a building erected on ſome eminence, covered with a terrace for making aſtronomical obſervations.

The more celebrated obſervatories are,

1. The Greenwich-obſervatory, built in 1676, by order of Charles II. at the ſollicitations of Sir Jonas Moor, and Sir Chriſtopher Wren; and furniſhed with the moſt accurate inſtruments, particularly a noble ſextant of ſeven feet radius, with teleſcopic ſights.

The perſon to whom the province of obſerving was firſt committed, was Mr. J. Flamſteed; a man, who, as Dr. Halley expreſſes it, ſeemed born for the employment. For the ſpace of fourteen years, with unwearied pains, he watched the motion of the planets; chiefly thoſe of the moon, as it was given him in charge, that a new theory of that planet, exhibiting all irregularities, being found, the longitude might thence be determined.

In the year 1690, having provided himſelf with a mural arch, of ſeven feet diameter, well fixed in the plane of the meridian, he began to verify his catalogue of fixed ſtars, which hitherto had depended altogether on the diſtances meaſured with the ſextant, after a new and very different manner; *viz.* by taking the meridional altitudes, and the moments of culmination, or the right aſcenſion and declination. This inſtrument he was ſo pleaſed with, that he laid the uſe of the ſextant almoſt wholly aſide. Thus was the aſtronomer royal employed for thirty years; in the courſe of which time, nothing had appeared in public, worth ſo much expence and preparation; ſo that the obſerver ſeemed rather to have been employed for his own ſake, and that of a few friends, than for the public: though it was notorious the obſervations that had been made, were very numerous, and the papers ſwelled to a great bulk.

This occaſioned prince George of Denmark, in the year 1704, to appoint certain members of the royal ſociety, *viz.* the honourable Francis Robarts, Sir Chriſtopher Wren, Sir Iſaac Newton, Dr. Gregory, and Dr. Arbuthnot, to inſpect Flamſteed's papers, and chooſe out of them ſuch as they ſhould think fit for the preſs; purpoſing to print them at his own expence: but, the patron of the work dying, before the impreſſion was half finiſhed, it lay ſtill for ſome time; till at length it was reſumed by order of queen Anne, and the care of the preſs committed to Dr. Arbuthnot, and that of correcting and ſupplying the copy, to Dr. Halley: ſuch was the riſe and progreſs of the Hiſtoria Cœleſtis; the principal part whereof is the catalogue of the fixed ſtars, called alſo the Greenwich-Catalogue. The Greenwich-Obſervatory is found, by very accurate obſervations, to lie in 51° 28′ 30″. north latitude.

2. The pariſh-Obſervatory, built by the late Louis XIV, in the Fauxbourg St. Jaques.

It is a very ſingular, but withal a very magnificent building; the deſign of monſieur Perault: it is eighty feet high, and at top is a terras.

The difference in longitude between this and the Greenwich-Obſervatory is 2° 20′ weſt.

In it is a cave, or cellar, 170 feet deſcent, for experiments that are to be made far from the ſun, *&c.* particularly ſuch as relate to congelations, refrigerations, indurations, conſervations, *&c.*

3. Tycho Brahe's Obſervatory which was in the little iſland Ween, or Scarlet-Iſland, between the coaſts of Schonen and Zeland, in the Baltic.

It was erected and furniſhed with inſtruments at his own expence, and called by him Uraniburg.

Here he ſpent twenty years in obſerving the ſtars: the reſult is his catalogue.

Mr. Gordon, in the Philoſophical Tranſactions, obſerves, that this was none of the fitteſt places for ſome kind of obſervations, particularly the riſings and ſettings; as lying too low, and being land-locked on all the points of the compaſs but three; and the land-horizon exceedingly rugged and uneven.

4. Pekin-Obſervatory; father Le Compte deſcribes a very magnificent Obſervatory, erected and furniſhed by the late emperor of China, in his capital, at the interceſſion of ſome jeſuits, miſſionaries, chiefly father Verbieſt, whom he made his chief obſerver.

The inſtruments are exceedingly large; but the diviſions leſs accurate, and the contrivance in ſome reſpect, leſs commodious than thoſe of the Europeans:

The

The chief are an armillary, zodiacal ſphere, of ſix Paris feet diameter; an equinoctial ſphere, of ſix feet diameter; an azimuthal horizon, ſix feet diameter; a large quadrant, ſix feet radius; a ſextant, eight feet radius; and a celeſtial globe, ſix feet diameter.

OBSESSION, the being beſet by an evil ſpirit, which without entering the body, torments, and, as it were, beſieges the perſon from without; in which ſenſe, it differs from poſſeſſion.

The marks of obſeſſion, according to ſome, are a being hoiſted into the air, and thrown violently down without being hurt; ſpeaking languages never learnt, having an averſion to all acts and offices of religion, &c. Some phyſicians look on all caſes of obſeſſion as natural, and curable by natural medicines, particularly purgatives and vomitives.

OBSIDIANUS *Lapis*, the OBSIDIAN-STONE. See the article LAPIS.

OBSIDIONALIS, an epithet applied by the Romans to a ſort of crown. See the article CROWN.

OBSTRUCTION, in medicine, ſuch an obturation of the veſſels, as prevents the circulation of the fluids, whether of the ſound and vital, or of the morbid and peccant kind, through them; ariſing from an exceſs of the bulk of the fluid to be tranſmitted, above the capacity of the veſſel which ought to tranſmit it.

Such an obſtruction, then, proceeds either from the narrowneſs of the veſſels, or the exceſſive bulk of the fluids to be tranſmitted through them, or a concurrence of both theſe circumſtances. The narrowneſs of the veſſels is produced either by external compreſſion, the proper contraction of the veſſels themſelves, or an increaſed thickneſs in their membranes. The bulk of the molecules of the blood is increaſed by the viſcidity of the fluids, or by means of an error loci.

An obſtruction may alſo proceed from a narrowneſs of the veſſels in conjunction with a preternatural bulk of the molecules of the fluids.

The veſſels may be externally compreſſed. 1. By an adjacent tumour, either of the plethoric, inflamed, purulent, ſchirrhous, cancerous, œdematous, encyſted, ſteatomatous, atheromatous, melicerous, hydatidic, aneuriſmatic, varicoſe, tophous, pituitous, calculous, or callous kind. 2. By fractures, luxations, diſtortions, or diſtractions of the harder parts of the body, compreſſing the flexible and plient veſſels. 3. By every cauſe which preternaturally ſtretches and lengthens the veſſels, whether by a tumour, or the preſſure of a part when out of its natural ſituation, or by any external ſtretching force. 4. By external compreſſing cauſes, ſuch as too tight cloths, bandages, the weight of an incumbent body preſſing upon one particular part, and ligatures. This effect may alſo be produced by motion, attrition, and embracing other bodies, for when any part of the human body, is moved againſt an hard obſtacle, the flexible veſſels are neceſſarily compreſſed. An increaſed contraction, eſpecially of the ſpiral fibres, and alſo of the longitudinal, leſſens the cavities of the veſſels; and this contraction ariſes firſt from every cauſe which increaſes the elaſtic force of the fibres, veſſels, and viſcera; ſecondly, from the tumour and preternatural diſtention of thoſe minute veſſels, by a contexture of which the ſides of the larger veſſels are formed; and thirdly, by a diminution of that cauſe which dilates the veſſels whether for inſtance inanition or a languid ſtate of the veſſels. See TUMOUR, &c.

The thickneſs of the membranes of the veſſels is increaſed firſt by every tumour happening in thoſe veſſels, by the union and contexture of which the membranes are formed; and ſecondly, by calluſes, either of a cartilaginous, membranous, or bony nature, formed there.

The effects of an obſtruction are various, according to the diverſity of the obſtructed veſſel, and obſtructing matter. In the ſanguiferous arterial veſſels, an inflammation of the firſt kind happens; in the dilated lymphatic arterial veſſels, an inflammation of the ſecond kind; in the larger lymphatic veſſels, an œdema; in the ſmaller, pains without any apparent tumour; but in the pinguiferous, oſſeous, medullary, and biliary veſſels, other diſorders ariſe from an obſtruction. See the article INFLAMMATION, &c.

When the different kinds of obſtructions are diſtinctly known, it is no difficult matter to find a cure adapted to each. For that ſpecies of obſtruction which ariſes from external compreſſion indicates the removal of the compreſſing cauſe, if poſſible. That ſpecies of obſtruction which ariſes from an increaſed contraction of the fibres may be removed, firſt, by ſuch medicines as correct the too great contraction of the fibres, veſſels, and viſcera; ſecondly, and more eſpecially,

cially, if their virtues have immediate access to the part affected, which advantage is principally to be obtained by fomentations, fumigations, baths, and ointments; thirdly, by such remedies as empty the too full vessels composing the membranes. This intention is answered by evacuants, in general, but especially by laxative, diluting, resolvent, attenuating, detersive, and evacuant medicines applied to the vessels themselves; and fourthly, by such medicines as resolve callosities when formed. See the article FOMENTATION, &c.

The unfitness of the fluids for passing through the vessels, which depends upon their losing their spherical figure, may be known from an investigation of its causes, which are for the most part subjected to the senses. It is cured by such remedies as restore the spherical figure of the globules of the blood. Of this kind are all those things which increase the motion of the fluids through the vessels and viscera; such as all stimulating and corroborating medicines, as also brisk motion.

As the concretion and inspissation of the fluids arise from different causes, so it requires different methods of treatment, and different medicines according to the various conditions of the patient. And this diversity of causes, when investigated, will discover the most proper medicines, and the best method of using them. In general, the concretion of humours is removed first by the reciprocal motion of the vessels; secondly, by dilution; thirdly, by an attenuating fluid conveyed to the mass of blood mixed with it, and circulating along with it; and fourthly, by removing the coagulating cause.

The reciprocal motion of the vessels is procured first by such remedies as diminish the distending causes, such as venesection; secondly, by such medicines as corroborate the vessels; thirdly, by friction and muscular motion. See the article FRICTION.

The cause which coagulates the fluids, is removed by the influence of strongly attracting remedies, but when the fluids propelled into improper places become incapable of circulating, and by that means generate obstructions, many and violent disorders are produced: for which reason the source and cause from which they proceed ought to be carefully attended to. The cure is obtained, first by repelling the impacted matter with a retrograde motion into larger vessels; secondly, by resolving it; thirdly, by relaxing the vessels; and fourthly, by suppuration. See SUPPURATION, &c. The impacted motion is repelled with a retrograde motion, first by evacuating the fluid which acts upon the impacted matter by a liberal and sudden venesection, by which means the obstructing matter is forced back by the effort of the contracted vessel; and secondly, by friction performed from the extremities of the bases of the vessels. See the article EVACUANTS, &c.

OBSTRUCTION *of the bowels*, OBSTRUCTIO ALVI, in medicine. See the article COSTIVENESS.

OBSTRUENTS. See DEOBSTRUENTS.

OBTURATOR, in anatomy, a name for the two muscles of the thigh, one of which is the marsupialis, and is called obturator internus, and the other the obturator externus. These two muscles shut up the foramen or aperture between the os pubis and the hip-bone. The obturator internus comes from the internal circumference of the hole that is between the ischium and the os pubis; and passing thro' the sinuosity of the ischium, it is inserted into the dent of the great trochanter. Its tendon lies between the gemini: it turns the thigh to the outside. The obturator externus comes from the external circumference of the same hole as the former; it embraces the neck of the thigh-bone, and passes under the quadratus to the small cavity of the great trochanter.

OBTUSE, signifies blunt, dull, &c. in opposition to acute, sharp, &c. thus we say obtuse angle, obtuse angled triangle, &c. See the article ANGLE, &c.

OBVENTIONS, in antient law-books, signify the produce of a benefice, or spiritual living, including oblations, tithes, rents, and other revenues. See the article OBLATION, &c.

OBULARIA, in botany, a genus of the didynamia angiospermia class of plants, the corolla whereof is monopetalous, the tube is campanulated, ventricose and pervious, the limb is divided into four patulous segments. The fruit is a roundish compressed ventricose capsule; formed of two valves, and containing several seeds, in form of a fine powder.

OBY, a great river of Russia, which rises in Kalmuck Tartary, and forms the boundary between Europe and Asia, till it falls into the frozen ocean, after it has

run a courſe of above two thouſand miles.

OCCASIO, in antient law-writers, denotes a tribute which the lord impoſed on his vaſſals or tenants, on occaſion of war, or other exigencies.

OCCATION, a term in the antient huſbandry, by which they expreſſed what we do by harrowing, though they performed it with a different inſtrument; being a kind of rake, with the teeth of which they levelled the ground, and broke the clods; and with the hand ſtrewed the corn over this level ground. Then they brought on the plough and ploughed it in, ſo that the grain was ſown in furrows, as we expreſs it, and uſually came up as we ſee it does at this time with us in the ſame caſe in the lower parts only. After it had got a few leaves they went over the ground again with the ſame inſtrument to clear away the weeds, and move the earth about the roots of the young plants.

OCCIDENT, in geography, the weſtward quarter of the horizon, or that part of the horizon where the ecliptic, or the ſun therein, deſcends into the lower hemiſphere, in contradiſtinction to orient. Hence we uſe the word occidental, for any thing belonging to the weſt, as occidental bezoard, occidental pearl, *&c.*

OCCIPITAL, in anatomy, a term applied to the parts of the occiput, or back part of the ſkull. See the articles OCCIPITIS Os, and SKULL.

OCCIPITALES, or the OCCIPITAL MUSCLES, ariſe on each ſide from the os occipitis, where it adheres to the temporal bones: they aſcend upwards over the oſſa bregmatis, and join their aponeuroſes with the frontal ones, to which they ſeem to afford their fixed point: they, together with the frontal ones, cover the head as it were with a helmet, or cap, and they aſſiſt their actions. Morgagni has obſerved, that theſe occipital muſcles are ſometimes intirely wanting, and at others, when not abſolutely deficient, that they are ſo thin that it is ſcarce poſſible to ſee them: ſometimes alſo they are larger than uſual, and are divided as it were each into two. It has been from an examination of them in ſome ſubject, in which they were of this kind, that Sanctorius makes two occipital muſcles of each ſide.

OCCIPITIS Os, the OCCIPITAL BONE, in anatomy, the fourth bone of the cranium, ſo called from its ſituation in the occiput, or back part of the ſkull. See the article SKULL.

Its figure reſembles a lozenge, irregularly notched, or indented; being convex on the outſide, and concave within. It is very thick, and has a protuberance about the middle of its convex ſide: it has alſo three apophyſes, two of which are condyloide, ſerving for its articulation with the upper vertebra of the neck, whereby the whole head is ſupported.

OCCULT, ſomething ſecret, hidden, or inviſible. The occult ſciences, are magic, necromancy, cabbala, *&c.*

OCCULT, in geometry, is uſed for a line that is ſcarce perceivable, drawn with the point of the compaſſes, or a leaden pencil. Theſe lines are uſed in ſeveral operations, as the raiſing of plans, deſigns of building, pieces of perſpective, *&c.* They are to be effaced when the work is finiſhed.

OCCULTATION, in aſtronomy, the time a ſtar or planet is hid from our ſight, by the interpoſition of the body of the moon, or of ſome other planet. See the article ECLIPSE.

Circle of perpetual OCCULTATION, is a parallel in an oblique ſphere, as far diſtant from the depreſſed pole, as the elevated pole is from the horizon. See the article HORIZON.

All the ſtars between this parallel and the depreſſed pole, never riſe, but lie conſtantly hid under the horizon of the place.

OCCUPANT, in law, the perſon that firſt ſeizes, or gets poſſeſſion of a thing; and this by law muſt be of what has a natural exiſtence, as of land, *&c.* A perſon cannot be an occupant of a void poſſeſſion. Where the tenant, for the term of another's life, dies, the *celui qui vie* being alive, or in caſe a tenant for his own life, grants over his eſtate to another, and the grantee dies before him, there ſhall be an occupant, unleſs the grant be made alſo to the grantee's heirs during the term, *&c.* By ſtatute it is ordained, that an eſtate, *pur autre vie*, may be deviſed by will; and if no deviſe thereof is made, whereby the heir becomes ſpecial occupant, it ſhall be aſſets in his hands to pay debts, *&c.* or for want of ſuch heir, it is to go to the executors or adminiſtrators of the perſon who had the eſtate.

OCCUPATION, in a legal ſenſe, is taken for uſe or tenor, as in deeds it is frequently

quently ſaid, that ſuch lands are or lately were in the tenure or occupation of ſuch a perſon. This is likewiſe uſed for a trade or myſtery.

OCCUPATION, or OCCUPANCY, in the civil law, denotes the poſſeſſion of ſuch things as at preſent properly belong to no private perſon; but are capable of being made ſo, as by ſeizing or taking of ſpoils in war, by catching things wild by nature, as birds and beaſts of game, &c. or by finding things before undiſcovered, or loſt by their proper owners.

OCCUPAVIT, in law, a writ which iſſues for a perſon that is ejected out of an eſtate of inheritance in time of war.

OCCUPIERS of WALLING, a term in the ſalt-works for the perſons who are the ſworn officers that allot, in particular places, what quantity of ſalt is to be made, that the markets may not be overſtocked, and ſee that all is carried fairly and equally between the lord and the tenant.

OCEAN, in geography, that vaſt collection of ſalt and navigable waters, in which the two continents, the firſt including Europe, Aſia, and Africa, and the laſt America, are incloſed like iſlands. The ocean is diſtinguiſhed into three grand diviſions. 1. The Atlantic ocean, which divides Europe and Africa from America, which is generally about three thouſand miles wide. 2. The pacific ocean, or South-ſea, which divides America from Aſia, and is generally about ten thouſand miles over: and, 3. The Indian ocean, which ſeparates the Eaſt-Indies from Africa, which is three thouſand miles over. The other ſeas, which are called oceans, are only parts or branches of theſe, and uſually receive their names from the countries they border upon.

For the ſaltneſs, tides, &c. of the ocean, ſee the articles SEA, TIDES, &c.

OCHLOCRACY, ὀχλοκρατία, that form of government wherein the populace has the chief adminiſtration of affairs.

OCHNA, in botany, a genus of the polyandria-monogynia claſs of plants, the flower of which conſiſts of five roundiſh petals, and its fruit is a very large, truncated, and fleſhy receptacle, containing on each ſide a ſingle berry, with a ſingle oval ſeed.

OCHRE, *ochra*, in natural hiſtory, a genus of earths, ſlightly coherent, and compoſed of fine, ſmooth, ſoft, argillaceous particles, rough to the touch, and readily diffuſible in water.

Ochres are of various colours, as red, yellow, blue, brown, green, &c. Of the red there are eleven ſpecies, of the yellow as many, of blue one, of brown two, of green one, and of black two. All which have, at one time or other, been uſed in painting.

The earths of this kind, uſed in medicine, are only three. 1. A yellow kind, deſcribed by Dioſcorides under the name of ochra attica, and eſteemed a very valuable external medicine in inflammations and tumours, applied in form of a cataplaſm. 2. The deep red kind, called rubrica ſinopica, and ſaid to be an excellent aſtringent, and conſequently good in diarrhœas, dyſenteries, and hæmorrhages of all kinds. 3. The ſpecies of ochre, called lapis armenus. See LAPIS.

OCHRIDA, or LOCHRIDA, a town of european Turky, in the province of Albania, 110 miles weſt of Salonichi: eaſt long. 21°, north lat. 41°.

OCHSENFURT, a town of Franconia, in Germany, twelve miles ſouth-eaſt of Wurtſburg.

OCIMUM, or OCYMUM, BASIL, in botany, a genus of the didynamia-gymnoſpermia claſs of plants, with a bilabiated cup: its flower is monopetalous and ringent; and its ſeeds, which are four in number, are contained in the cup, which cloſes for that purpoſe.

Both the herb and ſeeds of baſil are uſed in medicine, and are ſaid to be good in diſorders of the lungs, and to promote the menſes.

OCKA, a great river of Muſcovy, which joins the river Moſco at Kolomna.

OCKER, or OCKA, a river of Germany, which, riſing in the ſouthern part of the dutchy of Brunſwic, runs north, and paſſing by Wolfembuttle and Brunſwic, falls into the river Aller.

OCKINGHAM, a market-town of Berkſhire, ſeven miles eaſt of Reading.

OCTAETERIDES, in chronology, denotes a cycle of eight years, at the end of which three entire lunar months were added.

This cycle was in uſe at Athens, till Meton diſcovered the golden number. See the article GOLDEN NUMBER.

OCTAGON, or OCTOGON, in geometry, is a figure of eight ſides and angles: and this, when all the ſides and angles are equal, is called a regular octagon,

or one which may be inſcribed in a circle. If the radius of a circle circumſcribing a regular octagon be $= r$, and the ſide of the octagon $= y$; then $y = \sqrt{2r^2 - r\sqrt{2r^2}}$.

OCTAGON, in fortification, denotes a place that has eight baſtions. See the article FORTIFICATION.

OCTAHEDRON, or OCTAEDRON, in geometry, one of the five regular bodies, conſiſting of eight equal and equilateral triangles. See the article SOLID.

The ſquare of the ſide of the octahedron is to the ſquare of the diameter of the circumſcribing ſphere, as 1 to 2.

If the diameter of the ſphere be 2, the ſolidity of the octahedron inſcribed in it will be 1,33333, nearly.

The octahedron is two pyramids put together at their baſes, therefore its ſolidity may be found by multiplying the quadrangular baſe of either of them, by one third of the perpendicular height of one of them, and then doubling the product.

OCTANDRIA, in botany, one of the claſſes of plants eſtabliſhed by Linnæus, the eighth in order; the characters of which are, that all the plants comprehended in it have hermaphrodite flowers, and eight ſtamina or male parts in each. See the article BOTANY.

It is ſub-divided into orders, which are denominated from the number of piſtils contained in each flower: thus the octandria monogynia contain eight ſtamina, and only one piſtil; the octandria-digynia, eight ſtamina, and two piſtils; and ſo on, trigynia, tetragynia, &c. denoting three, four, &c. piſtils.

OCTANT, or OCTILE, in aſtronomy, that aſpect of two planets, wherein they are diſtant an eighth part of a circle, or 45° from each other. See ASPECT.

OCTAPLA, in matters of ſacred literature, denotes a polyglot bible, conſiſting of eight columns, and as many different verſions of the ſacred text, *viz.* the original Hebrew both in hebrew and greek characters, greek verſions, &c.

OCTATEUCH, an appellation given to the eight firſt books of the Old Teſtament. See the article CANON.

OCTAVE, in muſic, an harmonical interval, conſiſting of ſeven degrees, or leſſer intervals. See the article INTERVAL.

The moſt ſimple perception that we can have of two ſounds, is that of uniſons; in regard, the vibrations there begin and end together. The next to this is the octave, where the more acute ſound makes preciſely two vibrations, while the grave or deeper one makes one; and wherein, by conſequence, the vibrations of the two meet at every vibration of the more grave one. Hence uniſon and octave paſs almoſt for the ſame concord: hence alſo the proportion of the two ſounds that form the octave are in numbers or in lines, as 1 : 2; ſo that two chords or ſtrings of the ſame matter, thickneſs, and tenſion, one whereof is double the length of the other, produce the octave.

The octave is called among the antient authors the diapaſon, becauſe containing all the ſimple tones and chords; all of which derive their ſweetneſs from it, as they riſe more or leſs directly out of it. To be juſt, it muſt contain diatonically ſeven degrees or intervals, and conſequently eight terms or ſounds; whence it is called by the name of octave.

The octave containing in itſelf all the other ſimple concords, the degrees being the difference of thoſe concords; it is evident, the diviſion of the octave comprehends the diviſion of all the reſt. By joining therefore all the ſimple concords to a common fundamental, we have the following ſeries:

1 $\frac{5}{6}$ $\frac{4}{5}$ $\frac{3}{4}$ $\frac{2}{3}$ $\frac{3}{5}$ $\frac{3}{5}$ $\frac{1}{2}$

Fun. 3dl. 3d gr. 4th. 5th. 6 leſs. 6 gr. 8ve.

Again, the ſyſtem of the octave, containing all the original concords, and the compound concords being the ſum of the octave, and ſome leſſer concord; in order to have a ſeries to reach beyond an octave, we muſt continue them in the ſame order through a ſecond octave, as in the firſt, and ſo on to a third and fourth octave. Such a ſeries is called the ſcale of muſic. See the article SCALE.

The compoſition of octaves may be carried on infinitely, yet three or four is the greateſt length we go in ordinary practice. The old ſcales went but to two, or at moſt to three octaves, which is the full compaſs of an ordinary voice. When we ſay that the antient ſcales went but to two, or at furtheſt to three octaves, we do not mean that they were not allowed to exceed that compaſs; but that between the extremes of a double, or triple octave, were contained all the variety that was poſſible or needful; for even then, an active muſician would take the liberty to ſurprize them, by running through greater extremes.

Notwithſtanding the perfection of the octave, yet after the third, the agreement dimi-

diminiſhes very faſt; nor do they ever go ſo far at one movement as from one extreme to the other of a double or triple octave; ſeldom beyond a ſingle one; nor is either voice or inſtrument well able to go beyond. To form a fourth octave, if the acuter ſtring be half a foot long, which is but a ſmall length to render a clear ſound, the graver muſt be eight feet. If then we would go beyond a fourth octave, either the acute ſtring would be too ſhort, or the grave one too long; not but this inconvenience is remedied by a greater tenſion of each.

The octave is not only the greateſt interval of the ſeven original concords, but the firſt in perfection; as it is the greateſt interval, all the leſſer concords are contained in it: indeed, the manner wherein the leſſer are found in an octave, is ſomewhat extraordinary, *viz.* by taking both an harmonical and arithmetical mean between the extremes of the octave, and then both an arithmetical and harmonical mean between each extreme, and the moſt diſtant of the two means laſt found, *i. e.* between the leſs extreme and the firſt arithmetical, and between the greateſt extreme and the firſt harmonical mean, you will have all the leſſer concords.

Nicomachus, diſciple of Pythagoras, ſays, that to produce an octave, take two chords and ſtretch the one by a weight of ſix pounds, and the other by one of twelve; the ſound of the laſt will be an octave to that ſtretched by the ſix pound weight; and from thence proceeds to fix the proportion of weights to be uſed for the production of the other intervals.

Mr. Malcolm obſerves, that any wind-inſtrument being over-blown, the ſound will riſe to an octave, and no other concord, which he aſcribes to the perfection of the octave, and its being next to uniſon. From the ſimple and perfect form of the octave ariſes this peculiar property, that it may be doubled and tripled, and ſtill be concord; that is, the ſum of two or more octaves are concord; though the more compound become gradually leſs agreeable; he adds, that there is ſuch an agreement between its extremes, that whatever ſound is concord to one, is ſo to the other.

Des Cartes, from an obſervation of the ſame kind from an organ-pipe, concludes, that no ſound is heard, but its acute octave ſeems ſome way or other to eccho in the ear.

The antient grecian ſyſtem had no greater compaſs than a double octave, or fifteenth, which they called dis diapaſon.

In thorough baſs, the octave and its replies are marked by a ſimple (8). In melody, the voice or ſound of an inſtrument may move an octave *per ſalto*, but very ſeldom two octaves, eſpecially the voice. In harmony, two octaves ſhould never follow one another, if differing in degree of tune *per ſalto* of a fifth or other interval; but it may be followed by any of the other concords, perfect or imperfect. See the article CONCORD.

OCTAVE, in law, ſignifies the eighth day inclusive after any feaſt.

OCTILE, or OCTANT. See OCTANT.

OCTOBER, in chronology, the tenth month of the julian year, conſiſting of thirty-one days: it obtained the name of October from its being the eighth month in the calendar of Romulus. See the articles MONTH and YEAR.

OCTOGON, or OCTAGON. See the article OCTAGON.

OCTOSTYLE, in the antient architecture, is the face of an edifice adorned with eight columns.

The eight columns of the octoſtyle may either be diſpoſed in a right line, as in the Pantheon, and the pſeudodiptere temple of Vitruvius; or in a circle, as in the round monothere temple of Apollo Pythius at Delphi, &c.

OCULUS, the eye, in anatomy. See the article EYE.

OCULUS BELI, in natural hiſtory, one of the ſemi-pellucid gems, of a greyiſh-white colour, variegated with yellow, and with a black central nucleus: it is of a roundiſh form, and its variegations very beautifully repreſent the pupil and iris of the eye: whence the name.

OCULUS CATI. See the article ASTERIA.

OCULUS LEPORINUS, in ſurgery, the ſame with ectropium. See ECTROPIUM.

OCULUS MUNDI, one of the ſemi pellucid gems, of a whitiſh-grey colour, without any variegations.

OCYMUM, or OCIMUM, in botany. See the article OCIMUM.

OCZAKOW, a port town of european Turky, the capital of Budziac Tartary: eaſt long. 35°, north lat. 46°.

ODA, in the turkiſh ſeraglio, ſignifies a claſs, order, or chamber. The grand ſeignior's pages are divided into five claſſes or chambers. The firſt, which is the loweſt in dignity, is called the great oda, from the great number of perſons that compoſe

compoſe it: theſe are the juniors, who are taught to read, write, and ſpeak the languages. The ſecond is called the little oda, where from the age of fourteen or fifteen years, till about twenty, they are trained up to arms, and the ſtudy of all the polite learning the Turks are acquainted with. The third chamber, called kilar oda, conſiſts of two hundred pages, which, beſides their other exerciſes, are under the command of the kilardgi-bachi, and ſerve in the pantry and fruitery. The fourth conſiſts only of twenty-four, who are under the command of the khazineda-bachi, and have charge of the treaſure in the grand ſignior's apartment, which they never enter with cloaths that have pockets. The fifth is called kas-oda, or privy-chamber, and is compoſed of only forty pages, who attend in the prince's chamber. Every night eight of theſe pages keep guard in the grand ſeignior's bed chamber, while he ſleeps: they take care that the light, which is conſtantly kept in the room, does not glare in his eyes, leſt it ſhould awake him; and if they find him diſturbed with troubleſome dreams, they cauſe him to be awaked by one of their agas.

ODA-BACHI, or ODDOBASSI, among the Turks, an officer equivalent to a ſerjeant or corporal among us. The common ſoldiers and janizaries, called oldachis, after having ſerved a certain term of years, are always preferred, and made biquelars; and from being biquelars, they in time become odabachis; that is, corporals of companies, whoſe numbers are not fixed; being ſometimes ten, and ſometimes twenty.

Their pay is ſix doubles per month, and they are diſtinguiſhed by a large felt a foot broad, with two large oſtrich-feathers.

ODE, in poetry, a ſong, or a compoſition proper to be ſung.

Among the antients, odes ſignified no more than ſongs; but with us they are very different things. The antient odes were generally compoſed in honour of their gods, as many of thoſe of Pindar and Horace.

Theſe had originally but one ſtanza, or ſtrophe, but afterwards they were divided into three parts, the ſtrophe, the antiſtrophe, and the epode. The prieſts going round the altar ſinging the praiſes of the gods, called the firſt entrance, when they turned to the left, the ſtrophe; the ſecond, turning to the right, they called antiſtrophe, or returning; and, laſtly, ſtanding before the altar, they ſung the remainder, which they called the epode. See the articles ANTISTROPHE, STROPHE, &c.

Heroes and triumphs were alſo ſubjects for the ode; and in courſe of time love and entertainments were likewiſe thought very ſuitable to it. Here Anacreon and Sapho excelled, and Horace has left us ſome of both ſorts wrote with peculiar ſweetneſs and elegance. Among the moderns, Dryden's ode on St. Cecilia's day, and Pope's on the ſame ſubject, are juſtly allowed to exceed every thing of the kind, either in this, or in any of the modern languages.

The diſtinguiſhing character of an ode is ſweetneſs; the poet is to ſoothe the minds of his readers by the variety of his verſe, and the delicacy of words; the beauty of numbers, and the livelineſs of expreſſions: for variety of numbers is eſſential to the ode. At firſt, indeed, the verſe of the ode was but of one kind, but for the ſake of pleaſure, and to adapt it to muſic, the poets ſo varied the numbers and feet, that their kinds are now almoſt innumerable. One of the moſt conſiderable is the Pindaric, diſtinguiſhed by its boldneſs, and the rapidity of its flights.

An ode may either be ſublime or of the lower ſtrain, jocoſe or ſerious, mournful or exulting, even ſometimes ſatirical, but never epigrammatical; and, in ſhort, it may conſiſt of wit, but not of that turn which is the peculiar characteriſtic of an epigram.

ODENSEE, the capital of Funen, one of the largeſt of the daniſh iſlands in the Baltic, ſituated ſeventy-two miles weſt of Copenhagen.

ODER, a river which riſes in the carpathian mountains, on the confines of Hungary, runs through Sileſia and Brandenburgh, and then ſeparating the eaſtern from the weſtern Pomerania, divides itſelf into ſeveral channels, and falls into the Baltic ſea.

ODER is alſo a town of Sileſia, ſituated on the river of the ſame name: eaſt long. 17° 17′, north lat. 49° 45′.

ODERBERG, a town in the dutchy of Sileſia, in Bohemia, ſituated on the river Oder: eaſt long. 17° 45′, north lat. 50° 6′.

ODERN,

ODERNHEIM, a town of Germany, in the palatinate of the Rhine, fifteen miles ſouth of Mentz.

ODEUM, in grecian antiquity, a muſic-theatre, built by Pericles, the inſide of which was filled with ſeats and ranges of pillars, and on the outſide the roof deſcended ſhelving downwards from a point in the center, with many bendings, in imitation of the king of Perſia's pavillion. Here the muſical prizes were contended for, and here alſo, according to Ariſtophanes, was a tribunal.

ODIHAM, a market-town of Hampſhire, twenty miles north-eaſt of Wincheſter.

ODIO ET ATIA, a writ antiently directed to the ſheriff, to enquire whether a perſon committed to priſon on ſuſpicion of murder, was juſtly committed, or whether it was done through malice; and if this laſt appeared to be the caſe, there iſſued another writ to the ſheriff to bail him.

ODONTALGIA, the TOOTH-ACH, in medicine. See the article TOOTH-ACH.

ODONTOIDE, in anatomy, an appellation given to a proceſs of the ſecond vertebra of the neck, from its reſemblance to a tooth. See VERTEBRÆ.

ODOR, or ODOUR. See SMELL.

ODOROUS, or ODORIFEROUS, appellations given to whatever ſmells ſtrongly, whether they be fetid or agreeable; but chiefly to things whoſe ſmell is briſk, and agreeable.

ODYSSEE, ὀδύσσεια, a celebrated epic poem of Homer, wherein are related the adventures of Ulyſſes, in his return from the ſiege of Troy. See the articles EPIC and ILIAD.

The moral of the odyſſee is, that a perſon's abſence from home, ſo that he cannot have an eye to his affairs, occaſions great diſorders; and, accordingly, the hero's abſence is the principal and moſt eſſential action of the whole poem. This poem, adds Boſſu, is better calculated for the people than the iliad, where the ſubjects ſuffer rather from the bad conduct of their princes, than by their own fault: whereas the meaneſt people are as liable to ruin their eſtates and families by negligence, as the greateſt princes; and, conſequently, have as much need of Homer's lectures, and are as capable of profiting by them, as kings themſelves.

OECONOMICS, the art of managing the affairs of a family, or community; and hence the perſon who takes care of the revenues and other affairs of churches, monaſteries, and the like, is termed oeconomus.

OECONOMY, οἰκονομία, denotes the prudent conduct, or diſcreet and frugal management, whether of a man's own eſtate, or that of another.

Animal OECONOMY, comprehends the various operations of nature, in the generation, nutrition, and preſervation of animals. See the articles GENERATION, NUTRITION, &c.

The doctrine of the animal oeconomy is nearly connected with phyſiology, which explains the ſeveral parts of the human body, their ſtructure, uſe, &c.

OECUMENICAL, ſignifies the ſame with general, or univerſal; as oecumenical council, biſhop, &c. See the articles COUNCIL and BISHOP.

OEDEMA, or PHLEGMATIC TUMOUR, in medicine and ſurgery, a ſort of tumour attended with paleneſs and cold, yielding little reſiſtance, retaining the print of the finger when preſſed with it, and accompanied with little or no pain. See the article TUMOUR.

This tumour obtains no certain ſituation in any particular part of the body, ſince the head, eye-lids, hands, ſometimes part, ſometimes the whole body, is afflicted with it. When the laſt mentioned is the caſe, the patient is ſaid to be troubled with a cachexy, leucophlegmatia, or dropſy. See the article CACHEXY, &c.

But if any part of the body is more ſubject to this diſorder than another, it is certainly the feet, which are at that time called ſwelled or oedematous feet. We ſhall treat diſtinctly of them in this place, that it may appear what is the true nature and rational method of phlegmatic tumours in whatever part of the body they ſhall be found.

The proximate cauſe of an oedema, ſays Heiſter, is doubtleſs to be found in the too great ſeroſity or viſcidity of the blood, which ſtagnates in the very minuteſt veſicles of the fat, or tunica celluloſa, and by this means ſtretches out the ſkin, with which it is immediately covered. This vitiated ſtate of the blood chiefly ariſes in men who are either of a cold and phlegmatic habit of body, or are advanced in years. It chiefly falls upon them in cold weather, or in the winter, when the inclemency of the ſeaſon heightens the diſorder of nature. Another cauſe of this diſorder is an irregularity in diet, by over-eating or drinking, and by the conſtant uſe of crude, cold, and hard meats.

Inter-

intermitting fevers or agues conduce very much to this diſorder, eſpecially if the patient indulges himſelf in an intemperate uſe of cooling liquors, while the fit is upon him, and his thirſt urgent: the diſeaſe frequently owes its riſe to too plentiful a diſcharge of blood from a wound, the noſe, or any other way; and ſometimes to obſtructions of the menſtrual diſcharge in women, or to a compreſſion of the vena cava by the weight of the fœtus in women far gone with child; or by any ſcirrhous body in the abdomen, which greatly hinders the return of the blood from the lower limbs; or to too ſedentary a way of life; or too great an indulgence in lying in bed; or, laſtly, to a phthiſis and difficulty of breathing; or to any diſorder or fatigue of body, which diſturbs or deſtroys the natural force of the heart in maintaining the circulation with due vigour.

From what has been ſaid it plainly appears by what ſigns an oedema manifeſts itſelf: therefore this obſervation alone remains to be added, that the harder the tumour is, and the longer the pitting which is made by the finger remains viſible, the ſtagnating fluid is in ſuch proportion thicker, and more tenacious.

The method of treating oedematous tumours is very different, according to the different cauſes to which they owe their riſe: therefore we are firſt to make diligent ſearch after the genuine cauſe of the diſorder, before we attempt its cure. The external method of treating theſe tumours in the legs and feet, is uſually to have recourſe to frequent frictions with warm cloths, to be repeated evening and morning till the part grows red and hot; then the limbs are to be diligently preſerved from the injuries of the cold air, by wearing ſtockings made of ſome warm fur, and at night keeping hot bricks about the legs and feet. After this there is a proper bandage to be applied, which is to aſcend gradually from the feet up to the knees. The firſt ſtep towards a cure by internal medicines, according to Junker, muſt be the correcting the mucous and viſcid ſtate of the humours by the neutral ſalts, as tartarum vitriolatum, and the like; and by gum ammoniacum, the roots of pimpernel, and woods of ſaſſafraſs, guaiacum, and the like; with the warm aromatics, as ginger and the ſpices, and carminative ſeeds; the matter when thus attenuated is to be evacuated by purges of a ſtrength proportioned to the conſtitution of the patient. After the uſe of theſe internal and the external medicines juſt before mentioned, Heiſter thinks it proper to uſe ſtrengthening remedies externally; for which end, the limb is to be placed over burning rectified ſpirits of wine, wrapping it up in cloths, in ſuch a manner as it may receive the ſteam. This will incline the ſtagnating fluids to eſcape through the ſkin, or render them fit to return into the circulation, and at the ſame time reſtore the natural tone of the limb. See the article OBSTRUCTION.

OEDENBURG, or EDENBURG, a town of Hungary, thirty miles ſouth of Vienna.

OELAND, a ſwediſh iſland in the Baltic ſea, between the continent of Gothland, and the iſle of Gothland: eaſt long. 16°, north lat. between 56° and 57° 30′.

OELFELD, a town in the dutchy of Magdeburg and circle of Lower Saxony, in Germany, twenty miles eaſt of Brunſwic.

OENANTHE, WATER-DROPWORT, in botany, a genus of the pentandria-digynia claſs of plants, with a radiated flower; the leſſer hermaphrodite ones of the diſc being compoſed of five inflexo-cordated petals: the fruit is compoſed of two oblong ſeeds, convex and ſtriated on one ſide, and plane on the other.

A ſpecies of this plant, called the hemlock-dropwort, with all the leaves multifid and obtuſe, is a terrible poiſon.

OENANTHE, in ornithology, a ſpecies of motacilla, with a grey back and white forehead, frequent in many parts of England, and much eſteemed at table: it is otherwiſe called vitiflora, the fallow-finch, and wheat-ear; being about the bigneſs of the ſparrow. See the article MOTACILLA.

OENAS, a name uſed by ſome authors for the wood-pigeon, or bluiſh columba, with a blackiſh ſpot on the wing. See the article COLUMBA.

OENELÆUM, in pharmacy, a mixture of wine and oil, uſually of thick black wine and oil of roſes; ſaid to be good for anointing wounds, to prevent an inflammation. See WINE and OIL.

OENOPTÆ, in grecian antiquity, a kind of cenſors at Athens, who regulated entertainments, and took care that none drank too much or too little.

OENOTHERA, the PRIMROSE of VIRGINIA, in botany, a genus of the octandria-monogynia claſs of plants, the flower of

of which conſiſts of four obverſely cordated petals: the fruit is a cylindrical capſule, with four low angles, being formed of four valves, and containing four cells, with numerous angulated ſeeds.

OESEL, an iſland at the entrance of the bay of Livonia, in the Baltic ſea; ſituated in 22° of eaſt longitude, and 58° of north latitude.

OESOPHAGUS, in anatomy, the gula, or gullet, is a membranaceous canal, reaching from the fauces to the ſtomach, and conveying into it the food taken in at the mouth. Its figure is ſomewhat like that of a funnel, and its upper part is called by anatomiſts the pharynx. Its ſituation is almoſt exactly behind the aſpera arteria, and longitudinally with the vertebræ of the neck and back; but when it enters the cavity of the thorax, it turns a little to the right, on account of the aorta. Its ſubſtance is compoſed of five coats, of which the firſt is membranaceous, and is continuous with the pleura in the thorax. The ſecond is robuſt and muſcular; and, in the human body, is compoſed of a double ſtratum of fibres: thoſe of one ſeries longitudinal, and thoſe of the other circular. The third coat is cellular, much like that of the inteſtines. The fourth is nervous, and diviſible into a number of other lamellæ, and furniſhed with a multitude of glands and veſſels: hence it is divided by Verheyen into two, under the names of a vaſculous and glandulous coat: this is continuous with the interior membrane of the mouth and ſtomach. The fifth is villoſe, and is called cruſta villoſa: this is always covered with a mucous liquor.

The muſcles of the pharynx ſerve to open and ſhut the oeſophagus. See the article PHARYNX.

The arteries of the oeſophagus are from the carotids, the aorta, the intercoſtals, and the cœliac. The veins are from the jugulars, the azygos, and the coronary vein of the ſtomach; and the nerves from the par vagum. There are alſo certain excretory ducts, called ductus excretorii novæ Vercelloni, which ariſe from the glands, and convey a ſaltiſh liquor into the œſophagus and ſtomach. The glands, from which theſe have their origin, are of three kinds: 1. The gaſtric glands, which are conglomerate, and are ſituated near the left orifice of the ſtomach. 2. The dorſal ones, which are ſituated near the fifth vertebra of the thorax. And, 3. The bronchial, tracheal, and thyroide. The uſe of the œſophagus is for deglutition, and a commixtion of the liquid ſerving for digeſtion.

OESTRUM VENERIS, in anatomy, a name by which ſome call the clitoris. See the article CLITORIS.

OESTRUS, in zoology, a genus of two-winged flies, the mouth of which is a ſimple fiſſure, without either teeth or proboſcis.

To this genus belong the breeze or gad-fly, the grey trumpet-fly, &c. diſtinguiſhed by the different variegations of their colours.

OETING, the capital of the county of the ſame name, in the circle of Swabia, in Germany: eaſt long. 10° 35′, and north lat. 49°.

OFFENBURG, a free imperial city of the circle of Swabia, in Germany, ſituated on the river Kintzig: eaſt long. 7° 40′, and north lat. 48° 30′.

OFFENCE, *delictum*, in law, an act committed againſt the law, or omitted where the law requires it.

Offences are diſtinguiſhed into two kinds, *viz.* ſuch as are capital, and ſuch as are not. Capital offences are thoſe for which the offender is to loſe his life. Thoſe not capital, where the offender may forfeit his lands, and goods; be fined, or ſuffer corporal puniſhment, or both, but not loſe his life. Under capital offences are comprehended high-treaſon, petit-treaſon, and felony: and offences not capital include the remaining part of the pleas of the crown, and come under the title of miſdemeanours. Some offences are puniſhable by the common law, but moſt of them by ſtatutes.

OFFICE, a particular charge or truſt, or a dignity attended with a public function.

The word is primarily uſed in ſpeaking of the offices of judicature and policy; as the office of a ſecretary of ſtate, the office of a ſheriff, of a juſtice of peace, &c. See SECRETARY, &c.

Every ſubject is, in general, eſteemed capable of an office, except a minor; but if an office, for the execution of juſtice, be granted to a perſon who has not the previous knowledge neceſſary for his executing it, the grant thereof is void: and no perſon, though he be ever ſo well qualified, can have a judicial office in reverſion.

The king cannot grant any office to the prejudice of another's freehold in his office, for this is contrary to law; and there-

therefore the judges have refuſed to admit an officer, though commanded by the king's ſign manual. Antient offices muſt be granted in the antient manner; nor can a new office be erected, or an old one be entitled to new fees, without an act of parliament. It is enacted, that no officer, or miniſter of the king, ſhall obtain his place or office on account of any gift, favour, or affection; and if the officers of juſtice, or thoſe belonging to the treaſury, *&c.* ſhall ſell any of the offices in their gift, or take any money, profit, or reward for them, they ſhall forfeit their eſtates therein; and the perſon ſo buying is rendered incapable of enjoying ſuch office: but this does not extend to the two chief juſtices, or to the judges of the aſſize, who may grant offices as before the act, 5 & 6 Edw. VI. c. 16. It is obſerved, that ſeveral offices were never intended for the uſe of one perſon; but offices of truſt are to be perſonally executed, and cannot be aſſigned to others. A public office by non-uſer becomes forfeited: but it is not ſo in the caſe of a private office, unleſs ſome ſpecial damage be received.

OFFICE alſo ſignifies a place or apartment appointed for officers to attend in, in order to diſcharge their reſpective duties and employments: as the ſecretary's office, office of ordnance, exciſe-office, ſignet-office, paper-office, pipe-office, ſix-clerks-office, *&c.* for the reſpective duties of each, ſee the articles SECRETARY, ORDNANCE, EXCISE, *&c.*

OFFICE, in architecture, denotes all the apartments appointed for the neceſſary occaſions of a palace or great houſe, as kitchens, pantries, confectionaries, *&c.*

OFFICE, in the canon-law, is uſed for a benefice that has no juriſdiction annexed to it.

It is alſo uſed for divine ſervice, celebrated in public: and in the romiſh church it is applied to a particular prayer preferred in honour of ſome ſaint: thus, when any ſaint is canonized, a particular office is at the ſame time aſſigned him, out of the common office of the confeſſors, the virgin, or the like. We ſay the office of the Holy Spirit, of the Virgin, of the paſſion, of the holy ſacrament, of the dead, *&c.*

OFFICE FOUND, in common law, is uſed for an inquiſition made to the king's uſe, of any thing found, by virtue of his office who makes inquiſition: hence, to traverſe an office, is to traverſe an inquiſition taken of office, before an eſcheator; and to return an office, is to return that which was found by virtue of the office.

By the common law, the king is not in poſſeſſion of lands that are forfeited for treaſon, during the offender's life, without an office-found thereon; but the land, whereof a perſon attainted of high treaſon dies ſeized in fee, is actually veſted in the king, though there be no office; for the blood being corrupted, the land cannot go by deſcent.

OFFICER, a perſon poſſeſſed of a poſt or office. See the preceding article.

The great officers of the crown, or ſtate, are the lord high ſteward, the lord high chancellor, the lord high treaſurer, the lord preſident of the council, the lord privy-ſeal, the lord chamberlain, the lord high conſtable, the earl marſhal; each of which ſee under its proper article.

Commiſſion-OFFICERS, are thoſe appointed by the king's commiſſion: ſuch are all from the general to the cornet incluſive, who are thus denominated in contradiſtinction to warrant-officers, who are appointed by the colonel's or captain's warrant, as quarter-maſters, ſerjeants, corporals, and even chaplains and ſurgeons.

Field OFFICERS are ſuch as command a whole regiment, as the colonel, lieutenant-colonel, and major.

Flag-OFFICERS. See FLAG-OFFICERS, and ADMIRAL.

General-OFFICERS are thoſe whoſe command is not limited to a ſingle company, troop, or regiment; but extends to a body of forces, compoſed of ſeveral regiments: ſuch are the general, lieutenant-general, major-generals, and brigadiers.

OFFICERS *of the houſhold.* See the article HOUSHOLD.

OFFICERS *of juſtice*, are thoſe entruſted with the adminiſtration of juſtice.

OFFICERS *of the mint.* See MINT.

Municipal OFFICERS. See MUNICIPAL.

OFFICERS *of police*, are thoſe in whom the government and direction of the affairs of a community are inveſted, as mayors, aldermen, ſheriffs, *&c.*

Reformed OFFICERS. See REFORMADO.

Royal OFFICERS are thoſe who adminiſter juſtice in the king's name, as the judges, *&c.* See the article JUDGE.

Sea-OFFICERS, or OFFICERS *of the marine*, are thoſe who command ſhips of war. See the article NAVY.

Staff-OFFICERS are ſuch as, in the king's preſence, bear a white ſtaff, or wand; and

and at other times, on their going abroad, have it carried before them by a footman bare-headed: ſuch are the lord ſteward, lord chamberlain, lord treaſurer, &c.

The white ſtaff is taken for a commiſſion, and at the king's death each of theſe officers breaks his ſtaff over the hearſe made for the king's body, and by this means lays down his commiſſion, and diſcharges all his inferior officers.

Subaltern-OFFICERS are all who adminiſter juſtice in the name of ſubjects; as thoſe who act under the earl marſhal, admiral, &c. In the army, the ſubaltern officers are the lieutenants, cornets, enſigns, ſerjeants, and corporals.

OFFICIAL, in the canon-law, an eccleſiaſtical judge, appointed by a biſhop, chapter, abbot, &c. with charge of the ſpiritual juriſdiction of the dioceſe. Of theſe there are two kinds; the one is as it were, the vicar-general of the dioceſe, and is called by the canoniſts officialis principalis, and in our ſtatute law, the biſhop's chancellor. There is no appeal from his court to the biſhop, his being eſteemed the biſhop's court. See BISHOP'S COURT.

The other, called officialis foraneus, is appointed by the biſhop, when the dioceſe is very large: he has but a limited juriſdiction, and has a certain extent of territory aſſigned him, wherein he reſides. See the article COMMISSARY.

OFFICIAL is alſo a deputy appointed by an archdeacon, as his aſſiſtant, who ſits as judge in the archdeacon's court.

OFFICINAL, in pharmacy, an appellation given to ſuch medicines, whether ſimple or compound, as are required to be conſtantly kept in the apothecaries ſhops. See the article MEDICINE.

OFFICIO, or SUSPENSION AB OFFICIO. See the article SUSPENSION.

OFFIDA, a town of Italy, ſubject to the pope, twenty-ſix miles ſouth of Loretto.

OFFING, or OFFIN, in the ſea-language, that part of the ſea a good diſtance from ſhore, where there is deep water, and no need of a pilot to conduct the ſhip: thus, if a ſhip from ſhore be ſeen ſailing out to ſeaward, they ſay, ſhe ſtands for the offing: and if a ſhip, having the ſhore near her, have another a good way without her, or towards the ſea, they ſay, that ſhip is in the offing.

OFF-SETS, in gardening, are the young ſhoots, that ſpring from the roots of plants; which being carefully ſeparated, and planted in a proper ſoil, ſerve to propagate the ſpecies.

OFF-SETS, in ſurveying, are perpendiculars let fall, and meaſuring from the ſtationary lines to the hedge, fence, or extremity of an encloſure. See the article SURVEYING.

OGEE, or O. G. in architecture, a moulding, conſiſting of two members, the one concave, and the other convex; or, of a round and a hollow, like an S. See MOULDING and CYMATIUM.

OGIVE, in architecture, an arch, or branch of a gothic vault; which, inſtead of being circular, paſſes diagonally from one angle to another, and forms a croſs with the other arches. See the articles ARCH, VAULT, &c.

The middle, where the ogives croſs each other, is called the key; being cut in form of a roſe, or a cul de lampe.

The members or mouldings of the ogives are called nerves, branches, or reins; and the arches which ſeparate the ogives, double arches.

OGLIO, a river which riſes in the Alps, in the county of Trent, and, after running ſouthward, thro' the lake Iſco and dutchy of Mantua, falls into the Po, a little weſt of Borgoforte.

OGLIO, or OLIO, in cookery. See the article OLIO.

OHIO, a large river of north America, which, taking its riſe in the mountains of Penſylvania, runs ſouth-weſt; and, after receiving many conſiderable branches, falls into the Meſſaſſippi.

OHNSPACH, or ANSPACH. See the article ANSPACH.

OIL, *oleum*, in natural hiſtory, an unctuous inflammable ſubſtance, drawn from ſeveral natural bodies, as animal and vegetable ſubſtances.

Animal oils are their fats, which are originally vegetable oils: all animal ſubſtances yield them, together with their volatile ſalts, in diſtillation.

Vegetable oils are obtained by expreſſion, infuſion, and diſtillation.

The oils by expreſſion are obtained from the ſeed, leaves, fruit, and bark of plants; thus, the ſeed of muſtard, and of the ſunflower, almonds, nuts, beech maſt, &c. afford a copious oil by expreſſion; and the leaves of roſemary, mint, rue, wormwood, thyme, ſage, &c. the berries of juniper, olives, indian cloves, nutmeg, mace, &c. the barks of cinnamon, ſaſſafras, and clove, yield a conſiderable proportion of eſſential oil by diſtillation.

The method of procuring oils by expreſſion is very ſimple: thus, if either ſweet

or bitter almonds, that are freſh, be pounded in a mortar, the oil may be forced out with a preſs, not heated: and in the ſame manner ſhould the oil be preſſed from linſeed and muſtard. The avoiding the uſe of heat in preparing theſe oils, intended for internal medicinal uſe, is of great importance, as heat gives them a very prejudicial rancidneſs.

This method holds of all thoſe vegetable matters that contain a copious oil, in a looſe manner, or in certain cavities or receptacles; the ſides whereof being broke, or ſqueezed, makes them let go the oil they contain: and thus the zeſt or oil of lemon-peel, orange-peel, citron-peel, *&c.* may be readily obtained by preſſure, without the uſe of fire. But how far this method of obtaining oils may be applied to advantage, ſeems not hitherto conſidered. It has been commonly applied to olives, almonds, linſeed, rape-ſeed, beech-maſt, ben-nuts, walnuts, bay-berries, mace, nutmeg, *&c.* but not that we know of to juniper-berries, caſhew-nuts, indian cloves, pine-apples, and many other ſubſtances that might be enumerated, both of foreign and domeſtic growth. It has, however, been of late ſucceſsfully applied to muſtard ſeed, ſo as to extract a curious gold coloured oil, leaving a cake behind, fit for making the common table muſtard.

Certain dry matters, as well as moiſt ones, may be made to afford oils by expreſſion, by grinding them into a meal, which being ſuſpended to receive the vapour of boiling water, will thus be moiſtened ſo as to afford an oil, in the ſame manner as almonds; and thus an oil may be procured from linſeed, hemp-ſeed, lettuce-ſeed, white poppy-ſeed, *&c.*

As to the treatment of oils obtained by expreſſion, they ſhould be ſuffered to depurate themſelves by ſtanding in a moderately cool place, to ſeparate from their water, and depoſite their fæces; from both which they ought to be carefully freed. And if they are not thus rendered ſufficiently pure, they may be waſhed well with freſh water, then thoroughly ſeparated from it again, by the ſeparating-glaſs, whereby they will be rendered bright and clear.

The next claſs of oils are thoſe made by infuſion, or decoction, wherein the virtues of ſome herb or flower is drawn out in the oil; as the oils of roſes, chamæmile, hypericum, elder, *&c.* However, theſe require to be differently treated: thus, for the ſcented flowers, particularly roſes, inſolation does beſt; becauſe much boiling would exhale their more fragrant parts: but oils impregnated with green herbs, as thoſe of chamæmile and elder, require long boiling, before they receive the green colour deſired. And, in general, no oils will bear to be boiled any longer than there remains ſome aqueous humidity, without turning black.

There are many compound oils prepared in the ſame manner, *viz.* by boiling and inſolation, and then ſtraining off the oil for uſe.

The ſame contrivance has likewiſe its uſe in making eſſences for the ſervice of the perfumer; not only where eſſential oils cannot be well obtained in ſufficient quantities, but alſo where they are too dear. The eſſential oil of jeſſamin-flowers, honey-ſuckles, ſweet-briar, damaſk-roſes, lillies of the valley, *&c.* are either extremely dear, or ſcarce obtainable by diſtillation; and, in ſome of them, the odorous matter is ſo ſubtile, as almoſt to be loſt in the operation. But if theſe flowers be barely infuſed in fine oil of nuts, or oil of ben, drawn without heat, and kept in a cool place, their ſubtile odorous matter will thus paſs into the oil, and richly impregnate it with their flavour. And theſe eſſences may be rendered ſtill more perfect by ſtraining off the oil at firſt put on, and letting it ſtand again, without heat, upon freſh flowers; repeating the operation twice or thrice.

Oils, or fats, may likewiſe be obtained, by boiling and expreſſion, from certain animal ſubſtances; for the membranes which contain the fat, being chopped ſmall, and ſet in a pan over the fire, become fit for the canvas-bag, and, by preſſure, afford a large quantity of fat; as we ſee in the art of chandlery, which thus extracting the oily matter, leaves a cake behind, commonly called graves. See the article CANDLE.

As to the eſſential oils of vegetables, they are obtained by diſtillation, with an alembic and a large refrigeratory. Water muſt be added to the materials, in ſufficient quantity, to prevent their burning; and they ſhould be macerated or digeſted in that water, a little time before diſtillation. The oil comes over with the water, and either ſwims on the top, or ſinks to the bottom, according as it is ſpecifically heavier or lighter than water. See DISTILLATION and GRAVITY.

This proceſs is applicable to the diſtilling of

of the eſſential oils from flowers, leaves, barks, roots, woods, gums, and balſams, with a ſlight alteration of circumſtances, as by longer digeſtion, briſker diſtillation, *&c.* according to the tenacity and hardneſs of the ſubject, the ponderoſity of the oil, *&c.*

Eſſential oils may be divided into two claſſes, according to their different ſpecific gravities; ſome floating upon water, and others readily ſinking to the bottom. Thus, the eſſential oils of cloves, cinnamon, and ſaſſafras, readily ſink; whereas thoſe of lavender, marjoram, mint, *&c.* ſwim in water: the lighteſt of theſe eſſential oils, is, perhaps, that of citron-peel, which even floats in ſpirit of wine; and the heavieſt ſeems to be oil of ſaſſafras.

For obtaining the full quantity of the more ponderous oils from cinnamon, cloves, ſaſſafras, *&c.* it is proper to reduce the ſubjects to powder; to digeſt this powder for ſome days in a warm place, with thrice its quantity of ſoft river-water, made very ſaline by the addition of ſea-ſalt, or ſharp with oil of vitriol; to uſe the ſtrained decoction, or liquor left behind in the ſtill, inſtead of common water, for freſh digeſtion; to uſe for the ſame purpoſe the water of the ſecond running, after being cleared of its oil; not to diſtil too large a quantity of theſe ſubjects at once; to leave a conſiderable part of the ſtill, or about one fourth empty; to uſe a briſk fire, or a ſtrong boiling heat, at the firſt, but to ſlacken it afterwards; to have a low ſtill-head, with a proper internal ledge and current leading to the noſe of the worm; and, finally, to cohobate the water, or pour back the liquor of the ſecond running upon the matter in the ſtill, repeating this once or twice.

The directions here laid down for obtaining the ponderous oils to advantage, are eaſily transferred to the obtaining of the lighter; ſo that we need not dwell particularly upon them.

Many of the eſſential oils being dear, it is a very common practice to adulterate or debaſe them ſeveral ways, ſo as to render them cheaper both to the ſeller and the buyer. Theſe ſeveral ways ſeem reducible to three general kinds, each of which has its proper method of detection, *viz.* 1. With expreſſed oils. 2. With alcohol. And, 3. With cheaper eſſential oils.

If an eſſential oil be adulterated with an expreſſed oil, it is eaſy to diſcover the fraud; by adding a little ſpirit of wine to a few drops of the ſuſpected eſſential oil, and ſhaking them together; for the ſpirit will diſſolve all the oil that is eſſential, or procured by diſtillation, and leave all the expreſſed oil that was mixed with it, untouched.

If an eſſential oil be adulterated with alcohol, or rectified ſpirit of wine, it may be done in any proportion, up to that of an equal quantity, without being eaſily diſcoverable either by the ſmell or taſte: the way to diſcover this fraud, is to drop a few drops of the oil into a glaſs of fair water: and if the oil be adulterated with ſpirit, the water will immediately turn milky, and, by continuing to ſhake the glaſs, the whole quantity of ſpirit will be abſorbed by the water, and leave the oil pure at top.

Finally, if an eſſential oil be adulterated by a cheaper eſſential oil, this is commonly done very artfully: the method is to put fir-wood, turpentine, or oil of turpentine into the ſtill, along with the herbs to be diſtilled for their oil, ſuch as roſemary, lavender, origanum, *&c.* and, by this means, the oil of turpentine diſtilled from theſe ingredients, comes over in great quantity, and intimately blended with the oil of the genuine ingredient. The oils thus adulterated always diſcover themſelves in time, by their own flavour being overpowered by the turpentine-ſmell; but the ready way to detect the fraud, is to drench a piece of rag, or paper, in the oil, and hold it before the fire; for thus the grateful flavour of the plant will fly off, and leave the naked turpentine-ſcent behind.

The virtues of oils being the ſame with thoſe of the ſubſtances from whence they are obtained, may be learned under their ſeveral articles.

As for the oils of beech, bricks, clover, *&c.* ſee the articles BEECH, BRICK, *&c.* Oil is well known to ſtop the violent ebullition of various ſubſtances: thus, if ſugar, honey, *&c.* be boiling, and in danger of riſing over the ſides of the veſſel, the pouring in a little oil, makes it immediately ſubſide.

OIL-MILL, one that ſerves to bruiſe or break the nuts, olives, and other fruits and grains, whoſe juice is to be drawn by expreſſion, to make oil; the ſtructure of which is deſcribed under the article OLIVE.

OIL, in commerce, makes a very conſiderable article. Ordinary oil of olives from any

any place, not otherwiſe rated, pays on importation 6l. 13s. $2\frac{40}{100}$d. the ton, and draws back on exportation 5l. 8s. more, if in a foreign bottom, 8s. Provence-oil pays, on importation, the ton, 21l. 13s. $2\frac{40}{100}$d. and draws back on exportation 12l. 18s. Oil of hemp-ſeed pays on importation, the ton, 11l. 7s. and draws back on exportation 10l. 17s. 6d. Rape and linſeed-oil pay, on importation, the ton, 20l. 19s. 6d. and draw back on exportation 19l. 6s. 3d. Other ſeed-oils, for every 20s. value, pay on importation 3s. $10\frac{20}{100}$d. and draw back on exportation 3s. $4\frac{1}{2}$d. and beſides, for every ton 7l. 10s. on importation, and draw back 7l. 10s. on being exported. Sallad-oil pays on importation, the gallon, $11\frac{55}{100}$d. and draws back on exportation $10\frac{12\frac{1}{2}}{160}$d. Seville, Majorca, Minorca, Apuglia, and Portugal-oil, pay on importation, the ton, 6l. 3s. $2\frac{40}{100}$d. and draw back on exportation 5l. 8s. Train-oil, or blubber of whales, and whale-fins, as alſo the ſkins, oil, blubber, or other produce whatever of ſeals, and other creatures, taken and caught in the Greenland-ſeas, Davis's ſtreights, or any other parts of the ſeas adjoining, were to be imported duty-free till December 25, 1757, and from thence to the end of the then next ſeſſion of parliament; and the ſame brought from Newfoundland, or any other of his majeſty's colonies, caught and imported in ſhips belonging to England, Wales, or Berwick upon Tweed, is alſo imported duty-free. Every ton of ſuch oil, taken by ſhipping belonging to any of his majeſty's colonies, and imported in ſuch ſhipping, pays 11s. $8\frac{40}{100}$d. and draws back on exportation 8s. $10\frac{20}{100}$d. Every ton of ſuch oil taken by the ſaid ſhipping, but imported in ſhips belonging to England, Wales, or Berwick upon Tweed, pays 5s. $10\frac{20}{100}$d. and draws back on exportation 4s. $5\frac{10}{100}$d. If caught and imported by foreigners, it pays by the ton 15l. 16s. and draws back on exportation 11l. 10s. 6d.

OIL *of the earth*, *oleum terræ*, a mineral fluid, of the conſiſtence of a ſyrup in winter, but in warm weather is little thicker than oil of olives. It is of a duſky black colour, very readily inflammable, and burning with a white but not very briſk or vivid flame.

The oleum terræ is found in Sumatra, where it is eſteemed in paralytic diſorders, uſed externally as an embrocation.

OIL *of petre*, or *Rock*-OIL. See the article PETROLEUM.

OIL-BEETLE, *Meloe*, in zoology. See the article MELOE.

OINTMENT, or UNGUENT, in pharmacy and ſurgery. See UNGUENT.

OISANS, a town of France, in the province of Dauphine, eighteen miles ſouth-eaſt of Grenoble.

OISTER, or OYSTER. See OYSTER.

OKEHAM, the capital of Rutlandſhire, fourteen miles eaſt of Leiceſter: weſt long. 45′, and north lat. 52° 40′.

OKER, or OCHRE, in natural hiſtory. See the article OCHRE.

OLAX, in botany, a genus of the triandria-monogynia claſs of plants, the calyx of which conſiſts of a ſingle-leafed concave, ſhort perianthium; the corolla is funnel-ſhaped; but the plant not being ſufficiently known, the fruit is not deſcribed.

OLDELSLO, a town in the circle of lower Saxony and dutchy of Holſtein, ſeventeen miles weſt of Lubec: it is ſubject to Denmark.

OLDENBURG, the capital of the county of the ſame name in Weſtphalia: eaſt long. 7° 32′, and north lat. 53° 35′.

OLDENBURG is alſo a town of Germany, in the dutchy of Holſtein, thirty-two miles north of Lubec.

OLDENDORP, a town of Germany, in the circle of Weſtphalia, thirty miles ſouth-weſt of Hanover.

OLDENLANDIA, a genus of the tetrandria-monogynia claſs of plants, the flower of which conſiſts of four oval patent petals, twice as long as the cup; and its fruit is a coreaceous globular capſule, containing two cells, with numerous very ſmall ſeeds in each.

OLDENZEL, a city of the united Netherlands, in the province of Overyſſel: eaſt long. 6° 50′, and north lat. 52° 30′.

OLDESLOE, a town of Germany, in the dutchy of Holſtein, fifteen miles weſt of Lubec.

OLD-WIFE-FISH, the name of a ſpecies of the baliſtes, with three ſpines on the back, and a forked tail. See BALISTES.

OLD-WIFE, or WRASSE. See WRASSE.

OLEA, the OLIVE-TREE, in botany. See the article OLIVE.

OLEAGINOUS, ſomething that partakes of the nature of oil, or out of which oil may be expreſſed.

OLECRANUM, or OLECRANON, in anatomy,

tomy, the poſterior apophyſis of the ulna, ſerving to form the eminence of the elbow. See ULNA and ELBOW.

OLERON, an iſland of France, near the coaſt of Poictou, fourteen miles ſouth-weſt of Rochelle, being about fifteen miles long, and ſix broad.

Sea-laws of OLERON, certain laws relating to maritime affairs, made in the time of Rich. I. when he was at the iſland Oleron.

Theſe laws, being accounted the moſt excellent ſea-laws in the world, are recorded in the black book of the admiralty.

OLERON, is alſo a city of Gaſcony in France, thirty miles ſouth of Dax.

OLESCO, a town of Upper Volhinia, in Poland: eaſt longitude 24°, and north latitude 50°.

OLEUM, OIL. See the article OIL.

OLFACTORY NERVES, the firſt pair of the head; ſo called from their being the immediate inſtruments of ſmelling. See the article NERVES.

OLIBANUM, FRANK-INCENSE, in pharmacy, a dry reſinous ſubſtance, brought to us in detached pieces, or drops as it were, like thoſe of maſtic; but larger, and of a leſs pure and pellucid texture.

It is of a pale yellowiſh-white colour, but with ſome mixture of a browniſh caſt in it. It is moderately heavy; its ſmell is ſtrong, but not diſagreeable; and its taſte bitter, acrid, and reſinous. The drops of olibanum ſometimes adhere two or more together; and, when two oblong and ſmall ones adhere to one another, fanciful writers have called ſuch male frank-incenſe, from the reſemblance of a man's teſticles; and, when two larger and rounder pieces adhered, they likened it to a woman's breaſts, and called it female frank-incenſe: and hence the origin of the thus teſticuloſum, and thus mammoſum of theſe writers. Sometimes four or five of theſe granules were found adhering to the bark of the tree; this was called the cluſter frankincenſe: and the ſmall fragments broke off from the reſt in the carriage, were preſerved ſeparately, and made another kind, under the name of manna thuris, the manna of frank-incenſe. How idle and ridiculous were ſuch diſtinctions among people, who knew at the ſame time, that the drug was the ſame under all theſe accidental forms!

Olibanum is to be choſen whitiſh, pure, dry, and as much approaching to pellucidity as may be. It has been known the moſt univerſally of any drug, perhaps, in the world, and that from as early times as thoſe of Theophraſtus and Dioſcorides, who deſcribe it under the name of libanos, and Hippocrates alſo mentions it under that of libanoton. The Latins call it thus and tus; and the Arabians, rouder, conder, and hateth.

The earlieſt accounts we have of any thing, tell us that frank-incenſe was in uſe among the ſacred rites and ſacrifices; and it is uſed in many different parts of the world at this time, to the ſame purpoſes. As well, however, as the world has been at all times acquainted with the drug itſelf, we are not yet well acquainted with its hiſtory. The country which produces it is a much diſputed point among authors: ſome affirm it was never found any where but in Arabia, and there only in that part called Sabæa, or, from this famous product, Arabia Thurifera: others are for bringing it from Ethiopia; and others from other places. If we are uncertain as to the place whence the olibanum is brought, we are much more as to the tree that produces it.

Olibanum is greatly commended by many againſt diſorders of the head and breaſt, and againſt diarrhœas and dyſenteries, and profluvia of the menſes, and fluor albus. Its doſe is from ten grains to a drachm. It is eſteemed by many a ſpecific in pleuriſies, eſpecially when epidemic.

Externally it is uſed in fumigations for diſorders of the head, and againſt catarrhs; and is an ingredient in ſome plaſters. It is a noble balſam in conſumptions, given in ſubſtance, or diſſolved with the yolk of an egg, into the form of an emulſion. There is an oil made of it per deliquium, in the ſame manner as that of myrrh: this is done by putting the powder of it in the white of a boiled egg, in a cellar, till it runs into a liquor; this is eſteemed a great coſmetic, and deſtroyer of pimples in the face. Dioſcorides had his doubts about the internal uſe of olibanum in large doſes; he talks of its bringing on madneſs, and even death; but none of the other Greek writers ſay any thing of its ill qualities, nor do we at preſent know any of them.

OLIGAEDRA, in natural hiſtory, the name of a genus of cryſtals, and expreſſes that which is compoſed of only a few planes. See the article CRYSTAL.

The bodies of this claſs are cryſtals of the

the imperfect kind, being compoſed of columns affixed irregularly to ſome ſolid body at one end, and at the other terminated by a pyramid; but the column and pyramid being both pentangular, the whole conſiſts only of ten planes, and not, as the common kind, of twelve. Of this genus there are only three known ſpecies; 1. A whitiſh one, with a ſhort pyramid, found principally in Germany, and ſometimes brought over to us, among parcels of common cryſtal. 2. A bright and colourleſs one, with a longer pyramid. This is found in Germany, and in ſome parts of England, as in the tin mines of Cornwal, and on Mendip hills. And, 3. A brown one, with a ſcabrous cruſt. This is produced only in the Eaſt Indies, and is well known by our lapidaries by its rough coat, and is eſteemed the fineſt of all brown cryſtals.

OLIGARCHY, a form of government, wherein the adminiſtration of affairs is lodged in the hands of a few perſons. See the article GOVERNMENT.

OLINDA, a city and port-town of Braſil: weſt long. 35°, and ſouth lat. 8°.

OLIO, or OGLIO, in cookery, denotes a ſavoury diſh compoſed of a great variety of ingredients, chiefly uſed by the Spaniards.

OLITE, a town of Navarre, in Spain, twenty-five miles ſouth of Pameluna.

OLIVA, a port-town of Poland, in the province of regal Pruſſia, only ſix miles weſt of Dantzic.

OLIVARIA CORPORA, in anatomy, two eminences of the medulla oblongata; ſo called from their reſembling an olive in ſhape.

OLIVE, *olea*, in botany, a genus of trees belonging to the diandria-monogynia claſs of plants, with a monopetalous flower divided into four ſegments at the limb; the fruit is an unilocular drupe, of a ſomewhat oval ſhape, containing an ovato-oblong rugoſe nut, with a kernel of the ſame ſhape.

Olives are very oily and ſmooth, and therefore not good for the ſtomach, being apt to pall and relax it too much. The oil of olives is judiciouſly mixed with cataplaſms of a maturating nature: it is accounted heating, emollient, and vulnerary; and good againſt coſtiveneſs and gripes.

In order to obtain the olive-oil, the olives are firſt bruiſed in a round trough, under a mill-ſtone, rolling perpendicularly over them; and when ſufficiently maſhed, put into the maye, or trough, *m*, of an olive-preſs (plate CLXXXVI. fig. 5.) where *a a* are the upright beams, or cheeks; *b*, the female, and *c*, the male-ſcrew; *e*, the bar for turning the ſcrew; *f*, the board on which the ſcrew preſſes; *g*, a cubical piece of wood, called a block; *h*, the peel, a circular board, to be put under the block. By turning the ſcrew, all the liquor is preſſed out of the maſhed olives, and is called virgin-oil; after which, hot water being poured upon the remainder in the preſs, a coarſer oil is obtained. Olive-oil keeps only about a year, after which it degenerates.

OLIVE-COLOUR, a yellow mingled with black. See the article COLOUR.

OLIVENZA, a town of Alentejo, in Portugal, ten miles ſouth of Elvas.

OLMUTS, a city of Moravia, ſeventy-five miles north of Vienna.

OLONE, a port-town of France, thirty miles north-weſt of Rochelle.

OLSE, a town of Sileſia, ten miles north of Breſlaw.

OLNSNITZ, a town of Upper Saxony, ſixty miles ſouth-weſt of Dreſden.

OLYMPIA, a port-town of the Morea, at preſent called Longinico: eaſt long. 21° 35′, and north lat. 37° 40′.

OLYMPIAD, ὀλυμπιας, in chronology, the ſpace or period of four years, whereby the Greeks reckoned time; for the epocha or commencement of which, ſee the article EPOCHA.

OLYMPIC GAMES were ſolemn games, famous among the antient Greeks, ſo called from Olympian Jupiter, to whom they were dedicated; and by ſome ſaid to be firſt inſtituted by Jupiter, after his victory over the ſons of Titan; others aſcribe their inſtitution to Hercules, not the ſon of Alcmena, but one of much greater antiquity; others, to Pelops; and others, to Hercules the ſon of Alcmena. Theſe games were ſo conſiderable, that the Greeks made them their epocha, diſtinguiſhing their years by the return of the olympics. See the article EPOCHA.

The care and management of theſe games belonged, for the moſt part, to the Eleans, who, on that account, enjoyed their poſſeſſions without moleſtation, or fear of war or violence. They appointed a certain number of judges, who were to take care, that thoſe who offered themſelves as competitors, performed their preparatory exerciſes; and theſe judges, during the ſolemnity, ſat naked, having before them a crown of victory, formed of wild-olive, which was preſented to whomſoever they ad-

adjudged it. Thoſe who were conquerors were called olympionices, and were loaded with honours by their countrymen. At theſe games, women were not allowed to be preſent; and if any woman was found to have paſſed the river Alpheus, during the ſolemnity, ſhe was to be thrown headlong from a rock.

OLYMPUS, the name of two mountains, the one in Bythinia, in the leſſer Aſia; and the other in the iſland of Cyprus.

OMAN, a province or kingdom in the ſouth-eaſt part of Arabia Felix.

OMBRE, a celebrated game at cards, borrowed from the Spaniards, and played by two, by three, or by five perſons, but generally by three. When three play at this game, nine cards are dealt to each party; the whole ombre pack being only forty, becauſe the eights, nines, and tens are thrown out of the pack. There are two ſorts of counters for ſtakes, the greater and the leſſer; the laſt having the ſame proportion to the other, as a penny to a ſhilling: of the greater counters each man ſtakes one for the game; and one of the leſſer for paſſing, for the hand when eldeſt, and for every card taken in. As to the order and the value of the cards, the ace of ſpades, called ſpadillo, is always the higheſt trump, in whatſoever ſuit the trump be; the manille, or black duce, is the ſecond: and the baſto, or ace of clubs, is always the third: the next in order is the king, the queen, the knave, the ſeven, the ſix, the five, four, and three. Of the black there are eleven trumps; of the red, twelve. The leaſt ſmall cards of the red are always the beſt, and the moſt of the black; except the duce and red ſeven, both of which are called the manilles, and are always ſecond when the red is a trump. The red ace, when a trump, enters into the fourth place, and is called punto, otherwiſe it is only called an ace. The three principal cards are called matadores, which have this privilege, that they are not obliged to attend an inferior trump when it leads; but, for want of a ſmall trump, the perſon may renounce trumps, and play any other card; and when theſe are all in the ſame hand, the others pay three of the greater counters a-piece; and with theſe three for a foundation, he may count as many matadores as he has cards in an uninterrupted ſeries of trumps; for all which the others are to pay one counter a-piece. He who hath the firſt hand is called ombre, and has his choice of playing the game, of naming the trump, and of taking in as many and as few cards as he pleaſes; and after him the ſecond, &c. But if he does not name the trump before he look on the cards he has taken in, any other may prevent him, by naming what trump he pleaſes. He that has the firſt hand, ſhould neither take in, nor play, unleſs he has at leaſt three ſure tricks in his hand; for, as he wins the game, who wins moſt tricks, he that can win five of the nine, has a ſure game: which is alſo the caſe if he wins four, and can ſo divide the tricks as that one perſon may win two, and the other three.

If a perſon plays without diſcarding or changing any cards, this is called playing ſans prendre; and if another wins more tricks than he, he is ſaid to win codille. The over-ſights in the courſe of the game, are called beaſts. And if the ombre wins all the nine tricks, it is called winning the vole.

In ombre by five, which many, on account of its not requiring ſo cloſe an attention, prefer to that by three, only eight cards a-piece are dealt; and five tricks muſt be won, otherwiſe the ombre is beaſted. Here, the perſon who undertakes the game, after naming the trump, calls a king to his aſſiſtance; upon which the perſon in whoſe hand the king is, without diſcovering himſelf, is to aſſiſt him as a partner, and to ſhare his fate. If, between both, they can make five tricks, the ombre wins two counters, and the auxiliary king only one; but when the counters are even, they divide them equally. If the ombre venture the game without calling in any king, this too is called playing ſans prendre; in which caſe the other four are all againſt him, and he muſt win five tricks alone, or be beaſted. The reſt is much the ſame as by three.

OMBRE DE SOLEIL, SHADOW OF THE SUN, in heraldry, is when the ſun is borne in armory, ſo as that the eyes, noſe, and mouth, which at other times are repreſented, do not appear; and the colouring is thin, ſo that the field can appear through it.

OMBRIA, the antient name of a province of Italy, in the territory of the pope, now called Spoletto and Perugia.

OMBRO, or LOMBRO, a town of Italy, in the dutchy of Tuſcany, and territory of the Siennois, ſituated near the Tuſcan ſea, a little ſouth of the lake of Caſtiglione, forty-five miles ſouth-weſt of Sienna.

OMELET, or AMLET, a kind of pancake or fricaſſee of eggs, with other ingredients, very uſual in Spain and France. It may be made as follows: the eggs being beaten, are to be ſeaſoned with ſalt and pepper, and then fried in butter, made boiling hot; this done, gravy is to be poured on, and the whole ſtewed with chives and parſley, ſhred ſmall: when one ſide is fried enough, it is to be turned on the other.

OMEN, a certain accident and caſual occurrence, that was thought to preſage either good or evil. There were three ſorts of omens among the antients; one was of things internal, or thoſe which affected the perſons themſelves; the ſecond, of things external, that only appeared to men, but did not make any impreſſion on them; the third were ominous words.

Of the firſt ſort were thoſe ſudden conſternations, called panic fears, that ſeized upon men without any viſible cauſe, and were therefore imputed to the dæmons, eſpecially the god Pan: of theſe panics there is frequent mention in hiſtory.

The ſecond ſort of omens were of ſuch things as appeared to men, but were not contained in their own bodies: of theſe there were ſeveral ſorts; the beginning of things were thought to contain ſomething ominous; it was thought a direful omen, when any thing unuſual beſel the temples, altars, or ſtatues of the gods; under the head of external omens are to be placed thoſe which offered themſelves in the way; ſuch were the meeting of an eunuch, a black, a bitch with whelps, a ſnake lying in the road, *&c.* Words were ominous, and as they were good or bad, were believed to preſage accordingly.

OMENTUM, or EPIPLOON, the CAWL, in anatomy, a membranaceous part, uſually furniſhed with a large quantity of fat; being placed under the peritonæum, and immediately above the inteſtines. See the article INTESTINES.

It is called by ſome rete, and reticulum, from the number of holes appearing in it, when raiſed, and giving it the reſemblance of a net.

As to its ſituation, it uſually occupies only the upper part of the abdomen; though it is ſometimes found extended to the lower part: its weight in a perſon not remarkably fat or lean, is about half a pound: its lower part is evidently looſe and free; but in its upper part it is joined, anteriorly, to the bottom of the ſtomach, the duodenum, and the ſpleen; and poſteriorly to the colon and pancreas.

It is compoſed of a very tender double membrane, forming a kind of pouch or cavity, called its burſa, and replete with fat, lodged in certain cellules, forming a kind of ducts, with certain areolæ, or membranaceous ſpaces between them. Its arteries come from the cœliac, and are very numerous; its veins ariſe chiefly from the ſplenic branch of the vena portæ; and its nerves are from the intercoſtals and the par vagum. See the articles ARTERY, VEIN, *&c.*

It has a very remarkable aperture, by which it may be conveniently diſtended by inflation; and there are generally ſome ſmall holes in it, though the large ones, from which it got the name rete, are adventitious.

The uſes of the omentum are, 1. By its lubricity, to render the natural and neceſſary motions of the inteſtines eaſy. 2. To cheriſh and defend the inteſtines from cold. 3. To aſſiſt in the formation of the bile, the fatty part of which is wholly owing to the veſſels of the omentum; every thing that returns from this part going to the liver. 4. To temperate the acrimony of the humours. And, probably, 5. To ſerve, as all the other fat of the body, to give it nouriſhment, when it is incapable of being nouriſhed any other way.

Falling down of the OMENTUM. On large wounds of the abdomen, the omentum will frequently protrude itſelf through the wound, either alone, or with ſome portion of the inteſtines. When this is the caſe, the firſt buſineſs is to enquire whether the protruded part preſerves its heat, moiſture, and natural colour: if it is not found faulty in any of theſe circumſtances, it muſt be gently returned; but when the ſtraitneſs of the wound forbids this, the protruded part muſt be taken off cloſe to the wound, and the wound healed according to the common form. The omentum in this caſe will adhere to the internal part of the wound, without bringing on any diſorder, or inconvenience to the patient. But where the inteſtines fall out at the ſame time, the omentum is to be fomented, by an aſſiſtant, with warm milk and water, till the inteſtines are returned. See the article INTESTINES.

If any part of the protruded omentum be cold, dry, livid, putrid, or corrupted, the mortified part muſt be entirely cut

cut off before the reſt is returned, leſt the neighbouring parts ſhould be brought into conſent, which would inevitably prove fatal to the patient. Heiſter directs that the corrupted part be taken off in this manner: paſs a waxed thread two or three times round the ſound part of the omentum, near the place where it is injured, and faſten it with a knot, to prevent any hæmorrhage from enſuing after the reduction of it; when you have made a ſecure ligature, take off the corrupted part with the knife, or ſciſſars, and return what is ſound, leaving, at leaſt, the length of a foot of the ligature hanging out of the wound of the abdomen, till it ſlips off from the ſound part of the omentum. The wound muſt be dreſſed in the common way, the depending part of it being kept open by a large tent: and, at every dreſſing, the ligature muſt be pulled a little gently forward, till it has, at length, entirely ſlipped off from the ſound part of the omentum.

OMERS, or ST. OMERS, a city of Artois, in the french Netherlands, twenty miles ſouth of Dunkirk, and eighteen ſouth eaſt of Calais.

OMITTAS, or NON OMITTAS. See the article NON OMITTAS.

OMLANDS, a diviſion of the province of Groningen, in the United Provinces.

OMMEN, a town of the United Netherlands, in the province of Overyſſel, ſituated on the leſſer Vecht, ſeventeen miles north-eaſt of Deventer.

OMMENBURG, or AMELBURG, a town of Germany, in the landgravate of Heſſe, ſituated five miles eaſt of Marpurg.

OMOPHAGIA, an antient greek feſtival, in honour of Bacchus, ſurnamed Omophagos, *i. e.* eater of raw fleſh. This feſtival was obſerved in the ſame manner with the other feſtivals of Bacchus, in which they counterfeited madneſs; what was peculiar to it, was that the worſhipers uſed to eat the entrails of goats, raw and bloody, in imitation of the god, who was ſuppoſed to do the ſame thing.

OMOPHORIUM, in church-hiſtory, a little cloak, antiently wore by the biſhops, over their ſhoulders.

OMOPLATE, in anatomy, is uſed in general for the ſhoulder, but more particularly for the two bones ſituate on the hinder part of the upper ribs, one on each ſide, called alſo ſcapulæ and ſhoulder-blades. See the article SCAPULA.

Theſe bones are broad, and eſpecially in the middle; thick in their apophyſes, of a triangular form, concave within, and convex without, and are joined to the clavicles.

OMPHACIUM, in pharmacy, the juice of unripe grapes: alſo a name given by ſome to a kind of oil, pretended to be drawn from olives while green and ſour: but others charge it as an impoſture, and affirm that olives yield no oil at all till perfectly ripe.

OMPHALOCELE, in ſurgery, the ſame with exomphalus. See EXOMPHALUS.

OMPHALO-MESENTERIC, in anatomy. All fœtuſes are wrapped up in at leaſt two coats or membranes; moſt of them have a third, called allantoides, or urinary. See ALLANTOIS and FOETUS. Some, as the dog, cat, hare, &c. have a fourth, which has two blood-veſſels, *viz.* a vein and an artery, called omphalo-meſenterics, becauſe paſſing along the ſtring to the navel, and terminating in the meſentery.

ONANDAGOES, one of the tribes of the Iroquois, or Five Nations, ſituated on the lake Ontario, or Frontenac, in North America: they are Allies of Great Britain.

ONANIA, or ONANISM, terms which ſome late empiries have framed, to denote the crime of ſelf-pollution, mentioned in ſcripture to have been practiſed by Onan, and puniſhed in him with death. See the article POLLUTION.

ONEGA-LAKE, a lake upwards of an hundred miles long, and forty broad, ſituated in the empire of Ruſſia, between 61° and 63° of north lat. and 35° eaſt longitude.

ONEGLIA, a port-town of Italy, ſeventy miles ſouth-weſt of Genoa, ſubject to the king of Sardinia: eaſt long. 8° 30′, and north lat. 44°.

ONEIROCRITICA, ονειροκριτικη, the art of interpreting dreams, or predicting future events from dreams. See the article DIVINATION.

Oneirocritics have eſtabliſhed three kinds of dreams, from which events may be predicted: 1. When the gods, or ſpirits, were ſuppoſed to converſe with men in their ſleep, and reveal to them future events. 2. When the images of the things themſelves were repreſented in viſion. 3. When future events were revealed by types and figures. Of the firſt kind was Agamemnon's dream, in the ſecond Iliad, where the ſhape of Neſtor, adviſed him to give the Trojans battle,

promiſing him ſucceſs and victory. Of the ſecond ſort was that of Alexander, who dreamed that he was to be murdered by Caſſander. And of the laſt ſpecies was that of Hecuba, who dreamed ſhe had conceived a firebrand.

ONERANDO PRO RATA PORTIONIS, in law, a writ iſſued in behalf of a joint-tenant, or tenant in common, who is diſtrained for more rent than his proportion of the land does come to.

ONGAR, a market-town of Eſſex, ten miles weſt of Chelmsford.

ONGLE'E, in heraldry, an appellation given to the talons or claws of beaſts or birds, when borne of a different colour from that of the body of the animal.

O. NI. a latin contraction uſed in the exchequer, by the ſheriff, when he makes up his accounts for iſſues, amercements and mean profits; at which time he marks upon each head O. NI. thereby to denote, *Oneretur, niſi habeat ſufficientem exonerationem*; that is, let him be charged, unleſs he have a ſufficient diſcharge: whereupon he becomes the king's debtor, and a debet or debt is ſet upon his head; in which caſe the other parties are debtors to the ſheriff.

ONION, *cepa*, in botany, *&c.* See CEPA.

ONISCUS, in zoology, a genus of inſects, which have limbs, but no wings, and which have oblong bodies and numerous legs, or more than ſix pairs. The characters of the oniſcus are, that the body is ſhort and broad, and approaching to an oval figure; the legs are ſeven or eight on each ſide; the more uſual number is ſeven. This genus comprehends the ſeveral ſorts of wood lice, and the millepes.

ONKOTOMY, in ſurgery, the operation of opening a tumour, or abſceſs. See the articles TUMOUR and ABSCESS.

ONOCLEA, in botany, a genus of the cryptogamia filices claſs: the fruit conſiſts of ſeveral globular capſules, with five valves and one cell, in which are ſeveral, long, ſmall, hairy ſeeds.

ONOCROTALUS, in ornithology, a bird commonly called the pelican. See the article PELICAN.

ONOMANCY, or rather ONOMAMANCY, ὀνομαμαντεία, a branch of divination, which foretels the good or bad fortune of a man, from the letters in his name. See the article DIVINATION.

From much the ſame principle the young Romans toaſted their miſtreſſes as often as there were letters in their names: hence Martial ſays,

Naevia ſex cyathis, ſeptem Juſtina bibatur.

ONOMATOPOEIA, in grammar and rhetoric, a figure where words are formed to reſemble the ſound made by the things ſignified; as the buz of bees, the cackling of hens, *&c.*

ONONIS, or ANONIS, REST-HARROW, in botany, a genus of the diadelphia decandria claſs of plants, the calyx of which is a perianthium cut into five ſegments, and almoſt of the length of the corolla, which is of the butterfly kind; the fruit is a turgid, hairy pod, with two valves, and one cell, in which are a few kidney-ſhaped ſeeds. See the article ANONIS, and plate XVIII. fig. 5.

The root and leaves of this plant are accounted attenuant and diſcutient, being chiefly preſcribed in the jaundice and obſtructions of the viſcera, the piles, *&c.*

ONOPORDUM, the COTTON-THISTLE, a genus of the ſyngeneſia-polygamia-æqualis claſs of plants, the compound flower of which is tubuloſe; and the proper ones monopetalous and funnel-faſhioned; the ſeeds are ſingle, crowned with down, and contained in the bottom of the cup.

ONOS, in ichthyology, the HADDOCK. See the article HADDOCK.

ONOTH, a town of Hungary, fifty miles north-eaſt of Buda, ſubject to the houſe of Auſtria.

ONRUST, a ſmall iſland at the mouth of the harbour of Batavia in the Eaſt-Indies.

ONSPACH, or ANSPACH. See the article ANSPACH.

ONTARIO, or FRONTENAC, a lake of North-America: ſituated in weſt long. 79°, and between 41° and 43° north lat.

ONTOLOGY, or ONTOSOPHY, the ſcience or doctrine of being, in the general or abſtract; coinciding with what is otherwiſe called metaphyſics. See the article METAPHYSICS.

ONYCOMANCY, a ſpecies of divination by means of the nails of the fingers. See the article DIVINATION.

ONYX, in natural hiſtory, one of the ſemipellucid gems, with variouſly coloured zones, but none red; being compoſed of cryſtal, debaſed by a ſmall admixture of earth; and made up either of a number of flat plates, or of a ſeries of coats ſurrounding a central nucleus, and ſeparated from each other by veins of a dif-

different colour, reſembling zones or belts.

We have four ſpecies of this gem. 1. A bluiſh-white one, with broad white zones. 2. A very pure onyx, with ſnow-white veins. 3. The jaſponyx, or horney-onyx, with green zones. 4. The brown onyx, with bluiſh-white zones.

The antients attributed wonderful properties to the onyx; and imagined that if worn on the finger it acted as a cardiac: they have alſo recommended it as an aſtringent, but at preſent no regard is paid to it.

OOST, a kiln for drying hops after they are picked from the ſtalks.

This is a ſquare room built up of brick or ſtone, ten feet wide, more or leſs, and with a door on one ſide: in the midſt of this room is a fire-place, about thirteen inches wide, and as much high; and in length reaching ſo nearly to the back of the kiln, that a man has juſt room to go round it. This fire-place is called a herſe, and the fire is let out into the room by ſeveral holes in the ſides. Five feet above this, is laid the floor on which the hops are to be laid to dry, and this muſt have a wall round it of four feet high, to keep the hops from falling out: at one ſide of the upper bed muſt be made a window to put out the hops as they are dried, into a room prepared for them: the beds may be made of laths an inch ſquare, placed at a quarter of an inch diſtance from one another, and ſupported by beams underneath; or it may be made of the ſame laths placed lattice-wiſe, and covered with large plates of double tin, taking care that the tin plates be well ſoldered; or inſtead of theſe plates, the new invented tiles filled with holes may be uſed: the hops are to be poured on this bed till it is covered about a foot thick with them, and they being ſpread even with a rake, the fire is to be lighted in the fire-place below: ſome recommend a wood fire, but experience ſhews that nothing does ſo well as charcoal; the fire muſt not be too fierce at firſt, and muſt not ſink or ſlacken, but rather increaſe, till the hops are near dried, leſt the moiſture or ſweat which the fire has raiſed, fall back and diſcolour them: if the floor is covered with tin plates, or the new invented tiles, the hops may be ſtirred about while drying, which will prevent thoſe being ſcorched which would otherwiſe lie at the bottom. See the article HOP.

OOSTERGO, the north diviſion of Weſt-Frieſland, one of the United Provinces.

OOZY *Ground*, a name given by the ſeamen to ſoft, ſlimy or muddy ground.

OPACITY, in philoſophy, a quality of bodies which renders them impervious to the rays of light. See LIGHT.

The opacity and tranſparency of bodies in general are occaſioned thus: let AB (plate. CLXXXVIII. fig. 2. n° 1.) be the ſurface of an opake body ABCD, a ray of light GH falling thereon in the point H, will in part be reflected into the ray HI, and by this reflected ray, the point H becomes viſible to the eye at I; and thus all the points, and conſequently the whole ſurface, is made viſible by that part of the light which it reflects. But the other part of the ray, entering into the body, being irregularly refracted and reflected through its internal ſubſtance of particles and pores, becomes divided, diſſipated, abſorbed and loſt therein; and therefore, as none of the rays can come from the internal parts to the eye, ſo none of thoſe parts can be viſible; and the body in that caſe is ſaid to be opake. In order to this we muſt conſider, that though the whole body be opake, yet the particles of ſuch a body are not ſingly opake, but freely tranſmit the light without reflecting any part between the ſurfaces, and are therefore in themſelves tranſparent; and were theſe particles contiguous to each other, the light would paſs from one to another, and ſo through the whole, without reflection; as we find by experiment it will paſs through ſeveral contiguous pieces of poliſhed glaſs, and thus produce tranſparency. But if the particles do not touch in ſuch a manner as to leave the interſtices or pores exceeding ſmall, there will be a reflection of light at every pore from the air which it there meets with, as being a medium of different denſity. For it is known by experiment, that though a ray of light will paſs from one piece of glaſs to another that is contiguous, without reflection, yet will it not paſs from the glaſs through the contiguous air without being in part reflected; conſequently, where the pores are large and very numerous, there the reflection of light will be ſo great upon the whole as to cauſe a total diſſipation and loſs of the light that enters the body, and ſo render it opake. This is confirmed by taking ten pieces of clear glaſs, and laying them one upon another over a leaf of print quite dry, and having

only air between them; then taking ten other pieces of the ſame glaſs, and putting them into water, ſo that it may fill all their interſtices; and then laying them on the ſame printed paper by the other, a perſon looking through each, will ſee the print, or reading, much more diſtinct, clear and bright through the latter pieces than through the former, the rays being more regularly tranſmitted through them where the denſity of the parts is not ſo unequal, and alſo with much leſs reflection than through the other, where the light undergoes a conſiderable reflection at every interſtice or plate of air between the glaſſes.

It is hence alſo that tranſparent bodies are rendered opake by ſeparating their parts, and rendering them more porous: thus beer, before it is raiſed into froth, is tranſparent; but the froth, by reaſon of its pores, becomes opake: thus dry paper is more opake than that which is wetted with water or oil, becauſe more porous: thus the oculus mundi ſtone is more opake when dry than when ſteeped in water; and glaſs, reduced to powder, is no longer tranſparent. Hence it follows, that the parts of bodies, and their pores, muſt not be leſs than a certain definite bigneſs to render them opake; for the opakeſt bodies, if their parts be ſubtilely divided, becomes perfectly tranſparent: thus copper, diſſolved in aqua-fortis, has all its particles pellucid; and the whole ſolution is tranſparent: thus a bubble blown off ſoap water, may become ſo thin on the top as to reflect no light, but will tranſmit the whole: thus water, ſalts, glaſs, ſtones, *&c.* though they are as porous as other bodies, yet their parts and interſtices are too ſmall to cauſe reflections in their common ſurfaces.

Therefore, in all tranſparent bodies, as B E F C, (*ibid.* n° 2.) a ray of light, K L, falling on its ſurface, in the point L, will there be in that part reflected, as before into the ray L M; the other part will go regularly, or in a rectilineal direction from the upper to the lower ſurface at N, where meeting with the air, (a medium of a different denſity) it will be in part reflected again into the ray N O; the other part goes out to the eye at P; by which means, all the internal parts from whence that ray comes, will be rendered viſible to the eye: and ſince this may be conceived of every point in the body, it is eaſy to underſtand how the whole becomes tranſparent. See REFLECTION and REFRACTION.

OPAL, in natural hiſtory, a ſpecies of the chroaſtaces genus of gems. See the article CHROASTACES.

The opal is a gem of a very peculiar kind, and has been eſteemed by many in all ages of very great value, though at preſent it is of leſs value, in proportion to its ſize, than any of the finer gems. It is ſofter than any other of the fine gems, and is difficult to poliſh to any degree of nicety. It is found of various ſhapes and ſizes; its moſt frequent bigneſs is between that of a pea and a horſe-bean, but it is found as ſmall as the head of a large pin, and has been ſeen of the ſize of a large walnut. Its figure is very various and uncertain, but it is never found in a cryſtalliform or columnar ſtate; its moſt uſual ſhape is an irregularly oblong one, convex above, flatted at bottom, and dented with various ſinuoſities at its ſides. It is often found among the looſe earth of mountains, ſometimes on the ſhores of rivers, and not unfrequently bedded in the coarſer kinds of jaſper. It is found in Egypt, Arabia, ſome parts of the Eaſt-Indies, and in many parts of Europe: thoſe of Europe, are principally from Bohemia, and are of a greeniſh or greyiſh colour; the colour of other opals much reſembles the fineſt mother of pearl, its baſis ſeeming a bluiſh or greyiſh white, but with a property of reflecting all the colours of the rainbow, as turned differently to the light.

OPALIA, in antiquity, feaſts celebrated at Rome in honour of the goddeſs Ops. Varro ſays they were held on the nineteenth of December, which was one of the days of the ſaturnalia: theſe two feaſts were celebrated in the ſame month, becauſe Saturn and Ops were huſband and wife: the vows offered to the goddeſs were made ſitting on the ground.

OPEN *flank*, in fortification that part of the flank which is covered by the orillon. See the article FLANK.

OPENING *of trenches*, is the firſt breaking of ground by the beſiegers, in order to carry on their approaches towards a place. See the article TRENCHES.

OPENING *of gates*, in aſtrology, is when one planet ſeparates from another, and preſently applies to a third; bearing rule in a ſign oppoſite to that ruled by the planet, with which it was before joined.

OPERA,

OPERA, a dramatic compoſition ſet to muſic, and ſung on the ſtage, accompanied with muſical inſtruments, and enriched with magnificent dreſſes, machines, and other decorations. Bruyere ſays, that it is eſſential to the opera to keep the mind, the eyes, and ears, in an inchantment. We derive the opera from the Venetians, among whom it is held one of the principal glories of the carnival. From the firſt riſe of the italian theatre, muſic has always been intermixed with action. The method of introducing it into the drama, has varied according to the ſeveral junctures. At firſt it began by the chorus always being ſung; then the prologues, interludes in verſe, and epilogue. When the theatre, by the final productions of a more poliſhed age, began to improve, the practice of intermixing muſic with the repreſentation of true tragedies or comedies, wore out in twenty or thirty years, and both were repreſented in the taſte and ſimplicity of the antients. By this ſudden change we may eaſily conceive that the uſe of muſic was quite laid aſide, becauſe inconſiſtent with theſe regular repreſentations. Sometime after, the poets abandoned that ſeverity for which they had been ſo remarkable at the beginning of their reformation; nor does any italian writer inform us of the reaſons. After that tragedies were repreſented without a chorus, muſic was again admitted into the prologue of comedies, and, by degrees, they introduced interludes which had no relation to the main ſubject; ſometimes thoſe interludes were unconnected one with another, and each made an action apart; but very often, three or four interludes formed a continued action, which was a great embelliſhment to the principal piece.

Formerly the opera comprehended all ſubjects; but ſince the machinery has been laid aſide, it deals no longer in fables divinities, muſic, paſtoral, and the like, but confines itſelf entirely to hiſtory. The old operas that have come to our hands, are proofs of the italian genius in treating hiſtorical ſubjects: but at preſent a barrenneſs of imagination ſeems to have ſucceeded this fertility, the french tragedies being commonly pillaged to furniſh out their plans, their ſcenes, and even their thoughts.

OPERATION, in general, the act of exerting or exerciſing ſome power or faculty, upon which an effect follows.

The nobleſt operation in men is that by the ſchoolmen, called vital or immanent, *viz.* the operations of the mind; which, with regard to the underſtanding, is threefold; apprehenſion or perception, diſcretion or judgment, and reaſoning or diſcourſe; the direction of which makes the object of logic. See the article PERCEPTION, *&c.*

With regard to the will, the immanent operations are willing and nilling, to which are referred loving and hating. From the will alſo proceed ſenſitive and locomotive operations, as ſeeing, ſpeaking, walking, *&c.*

OPERATION, in chirurgery and medicine, denotes a methodical action of the hand on the human body, in order to reeſtabliſh health. Chirurgical operations are performed differently and on various parts of the body, as blood-letting, and other operations of the like nature; operations on the head, on the eyes, the noſe, the mouth, the neck, the breaſt, the abdomen, and the parts of generation; alſo operations of lithotomy, under which are included the high operation, the lateral operation, and the low operation: other operations are thoſe in the art of midwifery, operations on the anus, on the extreme parts, *&c.* each of which are deſcribed under their ſeveral heads, and referred to from the ſeveral ſubjects. See PHLEBOTOMY, COUCHING, LITHOTOMY; as alſo, HEAD, NOSE, *&c.*

The beſt authors on chirurgical operations in general, are Celſus, Ægineta, Paræus, Fabr. ab Aquapendente, Solingens, Nuchius, Verduc, Vauguion, Chauvriere, Dionis, Pafynus, Maſierus, Garangeot, Marinus, Heiſter, Sharp, *&c.*

Operation is more particularly uſed in medicine, for the manner wherein any remedy produces its ſalutary effect; or that ſeries of actions, mediate or immediate, whereby its remote end is attained.

The ſeveral operations of each kind of medicines may be ſeen under their ſeveral heads. See EMETIC, DIURETICS, EMOLLIENTS, ERRHINES, *&c.*

OPERATIONS, in chemiſtry, denote the proceſſes or experiments whereby bodies are changed agreeably to the rules of the art, and to the end propoſed therein. All chemical operations require a certain or determinate heat or degree of fire, in order to perform them with the greateſt advantages; and this heat muſt be aſſigned and obtained in every caſe, to the

the great improvement of chymiſtry. See the articles HEAT and FIRE.

The changes chymiſtry produces in bodies, are reducible to two kinds, *viz.* an union of parts and a ſeparation thereof: thus chymiſtry either ſeparates ſpirits, ſalts, oils, &c. or compounds them together. A chemical operation then conſiſts in changing the ſituation of the parts, particularly either in moving ſome parts, but not the whole, which is called ſeparating; or in adding new parts, which is called uniting. All chemical operations, therefore, are reducible to two general kinds, *viz.* ſuch whereby the parts of bodies before joined or united are ſeparated, which the antient chemiſts called ſolution; or ſuch whereby the parts before disjoined are combined or united, called coagulation. Some, however, object digeſtion as a third ſpecies of operation, but Boerhaave ſhews that it is a compoſition of both. Moſt chemiſts, however, look upon this diviſion as ſcarcely accurate and minute enough, and ſubdivide the art into a number of particular and ſubordinate operations, as calcination, vitrification, diſtillation, ſublimation, cohobation, amalgamation, fermentation, putrefaction, &c. See the articles CALCINATION, VITRIFICATION, &c.

Dr. Shaw obſerves that the different ſucceſs of chemical operations, may be greatly owing to the particular vapours or effluvia floating in the laboratory where ſuch operations are performed: thus if ſalt of tartar be run per deliquium where vinegar is diſtilling, it becomes regenerated tartar, a thing very different from that intended. See LABORATORY.

OPERATOR, a perſon who performs an operation: thus an operator in ſurgery and medicine, is one who operates or works with the hand on the human body, to preſerve or reſtore its health; hence a lithotomiſt is called an operator for the ſtone; a perſon who couches cataracts, &c. an operator for the eyes; and one who draws teeth, &c. an operator for the teeth.

OPHIDION, in ichthyology, a genus of the acanthopterygious claſs of fiſhes, the body of which is long, ſubcylindric, and has three fins; the branchioſtege-membrane contains ſeven bones, they are oblong, ſlender, and ſomewhat crooked, and are with great difficulty diſtinguiſhed, unleſs the fiſh have the ſkin firſt taken off. Of this genus there are two ſpecies, *viz.* the ophidion with four beards on the lower jaw, growing to the ſize of a large eel; and the ophidion without beards, growing to about a foot and a half long.

OPHIDION, is alſo the name whereby ſome authors call that ſpecies of the ſyngnathus, commonly termed the ſea-adder.

OPHIOGLOSSUM, in botany, the plant adder's tongue. See the article ADDER's *tongue*.

OPHIOMANCY, ὀφιομαντεία, in antiquity, the art of making predictions from ſerpents. Thus Calchas, on ſeeing a ſerpent devour eight ſparrows with their dam, foretold the duration of the ſiege of Troy. And the ſeven quoils of a ſerpent that was ſeen on Anchiſes's tomb, were interpreted to mean the ſeven years that Æneas wandered from place to place before he arrived in Latium. Thus, Virgil, Æn. l. 5. v. 85.

Septem enim gyros, ſeptena volumina traxit.

OPHIORHIZA, in botany, a genus of the pentandria-monogynia claſs of plants, the calyx of which is a ſingle leafed, permanent perianthium, cut into five ſegments; the corolla conſiſts of a ſingle funnel-faſhioned petal; the fruit is a broad, obtuſe, bilobated capſule, containing a great many angular ſeeds.

OPHIOXYLON, in botany, a genus of the polygamia-monoecia claſs of plants, the calyx of which is a very ſmall perianthium, cut into five ſegments; the corolla conſiſts of a ſingle funnel-ſhaped petal, the fruit of the hermaphrodite is a didymous bilocular berry, in which is a ſingle roundiſh ſeed.

OPHITES, in natural hiſtory, a ſort of variegated marble, of a duſky-green ground, ſprinkled with ſpots of a lighter green, otherwiſe called ſerpentine. See the article MARBLE.

OPHITES, in church hiſtory, chriſtian heretics, ſo called both from the veneration they had for the ſerpent that tempted Eve, and the worſhip they paid to a real ſerpent: they pretended that the ſerpent was Jeſus Chriſt, and that he taught men the knowledge of good and evil: they diſtinguiſhed between Jeſus and Chriſt; Jeſus, they ſaid, was born of the virgin, but Chriſt came down from heaven to be united with him: Jeſus was crucified, but Chriſt had left him to return to heaven. They diſtinguiſhed the God of the Jews, whom they termed Jaldabaoth, from the ſupreme God: to the former they aſcribed the body, to the latter the ſoul

ſoul of men. They had a live-ſerpent which they kept in a kind of cage; at certain times they opened the cage door and called the ſerpent: the animal came out, and mounting upon the table, twined itſelf about ſome loaves of bread; this bread they broke and diſtributed it to the company, who all kiſſed the ſerpent: this they called their Euchariſt.

OPHRIS, or OPHRYS, TWYBLADE, in botany, a genus of the gynandria-diandria claſs of plants, the flower of which conſiſts of five oblong petals; and the fruit is an oval capſule, containing a multitude of duſt-like ſeeds.

OPHTHALMIA, ὀφθαλμία, in medicine, an inflammation of the membranes which inveſt the eye; eſpecially of the adnata, or albugineous coat. See EYE.

The eyes are very much inflamed with great pain, tenſion, tumour, heat, and redneſs; and ſometimes there is ſuch a ſtrong ſenſation of pricking in the eye, as if it was cauſed by a needle or thorn. The eyes at firſt are full of ſcalding tears, which are followed by a pituitous matter, ſometimes ſmall in quantity, and ſometimes more plentiful: a ſordes adheres to the greater angle of the eye; and when the diſeaſe is violent, the neighbouring parts will ſwell, even as far as the cheeks, with a ſtrong pulſation of the adjacent arteries. The ſmall blood-veſſels are viſible, which in health are not to be ſeen, and all the white of the eye becomes red. If, beſides theſe external ſigns, there is an appearance of moths, duſt, flies, &c. floating in the air, there is an inflammation of the retina, which Dr. Pitcairn calls the internal ophthalmia. See the article *Diſeaſes of the* EYE.

As in all the diſeaſes of the eyes, ſo eſpecially in their inflammation, Hoffman directs the patient to abſtain from all ſpirituous liquors, the ſmoke of tobacco, and ſternutatories: he muſt likewiſe avoid ſmoky rooms, the vapours of onions and garlic, as alſo all vivid lights and glaring colours. The drink may be water alone, or a decoction of fennel-ſeeds, harts-horn and barley; the aliment muſt be light of digeſtion. Intemperance of all kinds renders perſons liable to this diſeaſe; as alſo a keen north-wind, and looking earneſtly at the fire, ſun, or glaring colours; likewiſe metallic vapours, coſtiveneſs, and unuſual refrigerations of the extreme parts, eſpecially in menſtruation. Sometimes it is owing to other diſeaſes, as the ſmall pox, meaſles, ſcurvy, and the driving back the gouty matter.

A ſlight ophthalmia is eaſily cured; a more ſevere one generally continues a month or longer, and often leaves a ſpot in the cornea, or depraves the humours of the eye.

Sydenham directs the patient to take away ten ounces of blood, and the next morning to give the common purging potion, which may be repeated twice more, with the interpoſition of two days between every doſe; and at night an ounce of diacodium. On the days in which purging is omitted, let the patient take four ounces, three or four times in a day, of the emulſion of the four greater cold ſeeds, and white poppy ſeeds: externally, take plantane-water, red roſes, and frog-ſpawn, of each one ounce, and prepared powder of tutty one dram; make a collyrium, and let a few drops be dropped in the eyes twice in a day, but not till after the firſt purge.

If the diſeaſe does not yield to repeated cathartics and bleeding, give an ounce of diacodium every night. In a ſtrumous ophthalmia, calomel is the only remedy, according to Pitcairn. In the mean while he recommends the application of bliſters to the neck, and after that ſetons, or iſſues at leaſt. Hoffman, beſides bliſters, ſetons, &c. recommends cupping, with ſcarification in the nape of the neck and behind the ears; and in the violent ſort of this diſeaſe, bleeding in the jugular; as alſo ſinapiſms of rocket-ſeeds boiled in wine, and then put into ſmall bags, and applied to the nape of the neck or to the arm-pits: for inward uſe he recommends an infuſion, in the manner of tea, of valerian-root, liquorice, elder-flowers, and fennel-ſeed, drank plentifully; and before the drinking of it to receive the vapour or ſteam into the eyes: externally, Shaw recommends a dram of camphor to be diſſolved in an ounce of french brandy, uſed as a collyrium. Junker ſays, if this compoſition makes the eye ſmart too much, blowing therein will ſoon take off the brandy, and leave all the camphor behind: but when there is a corroding acrimony, Hoffman recommends the mucilage of quince-ſeeds, with roſe-water, with a very little ſaffron, to which if it is neceſſary a little opium may be added: and every evening temperate pediluvia may be uſed. In a chronical

ophthalmia, where there is a continual dripping of a ſalt, ſharp lympha, mix a ſcruple of white vitriol with two drams of unſalted butter, of which put as much as the ſize of a pea into the greater angle of the eye, repeating it now and then. Dr. Cheyne ſays Æthiop's mineral, taken in a large doſe, twice a day, and continued a long time, never fails curing an inveterate ophthalmia.

OPHTHALMICS, medicines good in diſorders of the eyes. See EYE.

OPHTHALMIC NERVES, the fifth pair of the head. See the article NERVES.

OPHTHALMOGRAPHIA, the deſcription of the eye. See the article EYE.

OPHTHALMOSCOPY, a branch of phyſiognomy, which deduces the knowledge of a man's temper and manners from the appearance of his eyes.

OPIATES, medicines of a thicker conſiſtence than a ſyrup, prepared with opium ſcarcely fluid. They conſiſt of various ingredients, made up with honey or ſyrup; and are to be uſed for a long time either for purgative, alterative or corroborative intentions. Hence there are opiates of three kinds; that is, of a purgative, an alterative, and of a corroborating quality.

The word opiate is alſo uſed, in general, for any medicine given with an intention to procure ſleep, whether in the form of electuaries, drops, or pills, of which kind is Matthew's pill; the beſt method of preparing which, according to Dr. James, is as follows: take of the extract of opium, of black hellebore, of liquorice, and the ſoap of tartar, each four ounces; let the hellebore and liquorice be made into a ſubtile powder; beat and mix theſe ingredients well together; then with two or three ounces of this maſs, mix an ounce of engliſh ſaffron cut into ſmall pieces, and beat them together till the ſaffron is ſo perfectly mixed that no part of it is diſcernible from the reſt; then beat and mix that with the reſt of the maſs. If this maſs be too dry, mix it with as much rectified oil of turpentine as is ſufficient to make it into a maſs fit to form into pills. Then put it into a gally-pot, over which tie a bladder or piece of leather, and ſet it by for uſe. For the effects of opiates, ſee the article OPIUM.

OPINION, is defined to be an aſſent of the mind to propoſitions not evidently true at firſt ſight.

Probable arguments beget opinion, as demonſtration does ſcience. See PROBABILITY and DEMONSTRATION.

OPISTHOTONOS, in medicine, a kind of convulſion, wherein the body is bent backwards. See CONVULSION.

OPIUM, in the materia medica, is an inſpiſſated juice, partly of the reſinous, and partly of the gummy kind, brought to us in cakes from eight ounces to a pound weight. It is very heavy, of a denſe texture, and not perfectly dry; but, in general, eaſily receives an impreſſion from the finger: its colour is a browniſh yellow, ſo very dark and duſky that at firſt ſight it appears black: it has a dead and faint ſmell, and its taſte is very bitter and acrid. It is to be choſen moderately firm, and not too ſoft; its ſmell and taſte ſhould be very ſtrong, and care is to be taken that there is no dirty or ſtony matter in it.

Opium is the juice of the papaver album, or white poppy, with which the fields of Aſia-Minor are in many places ſown, as ours are with corn. When the heads are near ripening, they wound them with an inſtrument that has five edges, which on being ſtuck into the head makes at once five long cuts in it; and from theſe wounds the opium flows, and is next day taken off by a perſon who goes round the field, and put up in a veſſel which he carries faſtened to his girdle: at the ſame time that this opium is collected, the oppoſite ſide of the poppy head is wounded, and the opium collected from it the next day. They diſtinguiſh, however, the produce of the firſt wounds from that of the ſucceeding ones, for the firſt juice afforded by the plant is greatly ſuperior to what is obtained afterwards. After they have collected the opium, they moiſten it with a ſmall quantity of water or honey, and work it a long time upon a flat, hard, and ſmooth board, with a thick and ſtrong inſtrument of the ſame wood, till it becomes of the conſiſtence of pitch; and then work it up with their hands, and form it into cakes or rolls for ſale.

Opium, on importation, pays a duty of 1 s. 11 ½ d. the lb. and draws back, on exportation, 1 s. $8\frac{40}{100}$ d.

Opium at preſent is in great eſteem, and is one of the moſt valuable of all the ſimple medicines: applied externally it is emollient, relaxing and diſcutient, and greatly promotes ſuppuration; if long kept upon the ſkin it takes off the hair, and always occaſions an itching in it; ſometimes

ſometimes it exulcerates it, and raiſes little bliſters if applied to a tender part. Laid on the perinæum it promotes venereal inclinations; and ſometimes on external application, it allays pain, and even occaſions ſleep: but it muſt by no means be applied to the head, eſpecially to the ſutures of the ſkull, for it has been known to have the moſt terrible effects in this application, and even to bring on death itſelf. Opium, taken internally, removes melancholy, eaſes pain, and diſpoſes to ſleep; in many caſes removes hæmorrhages, provokes ſweating, and is a provocation to venery; and in general has a greater effect on women and children than on men. A moderate doſe is commonly under a grain, though according to the circumſtances two grains, or even three may be within the limits of this denomination; but cuſtom will make people bear a dram or more, tho' in this caſe nature is vitiated, and nothing is to be hence judged in regard to others. If given diſſolved, it operates in half an hour; if in a ſolid form, as in pills, or the like, it is ſometimes an hour and a half. Its firſt effect, in this caſe, is the making the patient cheerful, as if he had drank moderately of wine, and at the ſame time bold and above the fear of danger; for which reaſon the Turks always take it, when they are going to battle. A very immoderate doſe brings on a ſort of drunkenneſs, much like that occaſioned by an immoderate quantity of ſtrong liquors; cheerfulneſs and loud laughter at firſt, than a relaxation of the limbs, a loſs of memory, and light-headedneſs; then vertigoes, dimneſs of the eyes, with a laxity of the cornea and a dilatation of the pupils, a ſlowneſs of the pulſe, redneſs of the face, relaxation of the under jaws, ſwelling of the lips, difficulty of breathing, painful erection of the penis, convulſions, cold ſweats, and finally death. Thoſe who eſcape are uſually relieved by a great number of ſtools, or profuſe ſweats. People who have gradually accuſtomed themſelves to an immoderate uſe of opium, are ſubject to relaxations and weakneſſes of all the parts of the body: they are apt to be faint, idle and thoughtleſs; and are generally in a ſtupid and uncomfortable ſtate, except juſt after they have taken a freſh doſe: in ſhort, they loſe their appetite, and grow old before their time.

Prepared opium, commonly called extract of opium, is made by diſſolving opium in a ſufficient quantity of water with a gentle heat; then ſtraining the ſolution from the fæces, and evaporating it to the conſiſtence of honey. Tincture of opium, or liquid laudanum, otherwiſe called the thebaic tincture, is made as follows: take of prepared opium two ounces; of cinnamon and cloves, each one drachm: of white-wine, one pint: infuſe them a week without heat, and then filtre it through paper. Quincy obſerves of this preparation, that the addition of the ſpices are of no uſe.

OPOBALSAMUM, in the materia medica, the ſame with the true balſam. See the article BALSAM.

OPOPANAX, in the materia medica, is a gum-reſin of a tolerably firm texture, uſually brought to us in looſe granules or drops, and ſometimes in large maſſes, formed of a number of theſe, connected by a quantity of matter of the ſame kind; but theſe are uſually loaded with extraneous matter, and are greatly inferior to the pure looſe kind. The drops or granules of the fine opopanax, are on the outſide of a browniſh-red colour, and of a duſky-yelloviſh or whitiſh colour within: they are of a ſomewhat unctuous appearance, ſmooth on the ſurface; and are to be choſen in clear pieces, of a ſtrong ſmell, and acrid taſte.

On importation, opopanax pays a duty of 1 s. $3\frac{1}{2}$ d. per pound; and draws back, on exportation, 1 s. $1\frac{60}{100}$ d.

Opopanax is attenuating and diſcutient, and is gently purgative; it diſpels flatulencies, and is good in aſthmas, in inveterate coughs, and in diſorders of the head and nerves. It alſo promotes the menſes, and is good againſt all obſtructions of the viſcera.

OPOSSUM, in zoology, a ſpecies of didelphis, with the paps within the abdomen. See the article DIDELPHIS.

The opoſſum is a very ſingular animal, about fifteen inches long from the extremity of the noſe of the rump; and its tail is equal in length to the whole body: the legs are robuſt, and the feet armed with ſharp, long and crooked claws. But what is moſt ſingular in this animal, is, that the ſkin of the belly of the female is looſe, forming a kind of pouch or bag, with an aperture in it, at which, in time of danger, it takes in its young. See plate CLXXXVIII. fig. 6.

OPPILATION, in medicine, the act of obſtructing or ſtopping up the paſſages

of the body, by redundant or peccant humours. This word is chiefly uſed for obſtructions in the lower belly.

OPPILATIVES, the ſame with deobſtruent medicines. See DEOBSTRUENTS.

OPPELEN, a city of the kingdom of Bohemia, in the duchy of Sileſia: eaſt long. 17° 23′, north lat. 50° 45′.

OPPENHEIM, a town of Germany, in the palatinate of the Rhine.

OPPONENT, a perſon who withſtands or oppoſes another.

This term is chiefly uſed in ſcholaſtic or academic diſputes or exerciſes, where a perſon who oppoſes a theſis, or impugns it by his objections, is called opponent.

OPPOSITES, *oppoſita*, among logicians, ſimply taken, are ſuch things as differ among themſelves, but ſo as not to differ in like manner from ſome third. The ſchoolmen reckon four kinds of oppoſites, *viz.* relatively, contrarily, privatively, and contradictorily oppoſites.

Oppoſites complexly taken, are propoſitions that claſh with each other, as man is an animal, and man is not an animal.

OPPOSITE ANGLES. See ANGLE.

OPPOSITE CONES. See CONE.

OPPOSITE SECTIONS, are two hyperbolas made by cutting two oppoſite cones by the ſame plane. See the articles HYPERBOLA and CONIC SECTIONS.

OPPOSITION, in logic, the diſagreement between propoſitions, which have the ſame ſubject and the ſame predicate. See the article PROPOSITION.

OPPOSITION, in aſtronomy, is that aſpect or ſituation of two ſtars or planets, wherein they are diametrically oppoſite to each other, or 180° aſunder. See PLANET, ORBIT, SYZYGY, *&c.*

OPPOSITION, in geometry, the relation of two things, between which a line may be drawn perpendicular to both.

OPPOSITION, in rhetoric, a figure whereby two things are joined, which ſeem incompatible; as *a wiſe folly*.

OPTATIVE MOOD, in grammar, that which ſerves to expreſs an ardent deſire or wiſh for ſomething. See MOOD.

In moſt languages, except the Greek, the optative is only expreſſed by prefixing to the ſubjunctive an adverb of wiſhing, as *utinam*, in latin; *plut a Dieu*, in french, and *would to God*, in engliſh; but in greek, it is expreſſed by a peculiar inflection, αιμι, ις, οι, *&c.*

OPTERIA, in antiquity, preſents made by a bridegroom to his bride, when firſt conducted to him. See BRIDE, *&c.*

OPTICS, *optica*, taken properly and ſimply, is that ſcience which teaches the properties of direct viſion; but in a larger ſenſe, it may comprehend the whole doctrine of light and colours, and all the phænomena of viſible objects. In this large ſenſe, the incomparable Sir Iſaac Newton calls his book of light and colours, optics; or it is a mathematical ſcience that treats of light in general, and of every thing that is ſeen with direct rays; and explains the ſeveral properties and effects of viſion in general, and properly of that which is direct and ordinary. For when the rays of light are conſidered as reflected, the ſcience which teaches their laws and properties, is called catoptrics; and when the refraction of rays is conſidered, and the laws and nature of it explained and demonſtrated, the ſcience is called dioptrics. So that optics comprehends the whole, of which catoptrics and dioptrics are the two parts.

Optics makes likewiſe a conſiderable branch of natural philoſophy, both as it explains the laws of nature, according to which viſion is performed; and as it accounts for abundance of phyſical phænomena, otherwiſe inexplicable. For what can be determined about light, colours, tranſparency, opacity, meteors, the rainbow, parhelia, *&c.* but on principles of optics? What about the nature of the ſtars? The ſtructure of the mundane ſyſtem? The motion of the planets? The eclipſes of the luminaries, *&c.* Hence optics makes alſo a conſiderable part of aſtronomy. The beſt writers on this ſubject are Sir Iſaac Newton and Dr. Smith.

OPTICAL PLACE. See PLACE.

OPTIMATES, in roman antiquity, were, according to Tully, the beſt citizens, who deſired their actions might be approved of by the better ſort; and the populares, thoſe, who out of a thirſt of vainglory, did not conſider ſo much what was right, as what would pleaſe the populace.

Others will have the optimates to have been thoſe perſons of whatever rank, who ſtood up for the dignity of the chief magiſtrates, and who cared not if the inferior members of the common-wealth ſuffered for the advancement of the commanding powers: whereas the populares were thoſe who courted the favour of the commons,

commons, by encouraging them to ſue for greater privileges.

OPUNTIA, INDIAN-FIG, in botany, a ſpecies of cactus, diſtinguiſhed by being ramoſe and dichotomous. See the article CACTUS.

It is on this plant that the cochineal animal feeds. See COCHINEAL.

OR, in heraldry, denotes yellow, or gold-colour. See COLOUR and METAL.

In the coats of noblemen, it is blazoned topaz; and in thoſe of ſovereign princes, ſol.

It is repreſented in engraving by ſmall points or dots, ſcattered all over the field or bearing. See pl. CLXXXVIII. fig. 3.

ORACLE, among the heathens, was the anſwer which the gods were ſuppoſed to give to thoſe who conſulted them upon any affair of importance; it is alſo uſed for the god who it was thought gave the anſwer, and the place where it was given.

The credit of oracles was ſo great, that in all doubts and diſputes their determinations were held ſacred and inviolable: whence vaſt numbers flocked to them for advice about the management of their affairs; and no buſineſs of any conſequence was undertaken, ſcarce any peace concluded, any war waged, or any new form of government inſtituted, without the advice and approbation of ſome oracle. The anſwers were uſually given by the intervention of the prieſt or prieſteſs of the god who was conſulted, and generally expreſſed in ſuch dark and intermediate phraſes, as might be eaſily wreſted to prove the truth of the oracle whatever was the event. It is not, therefore, to be wondered at, that the prieſts who delivered them were in the higheſt credit and eſteem; and that they improved this reputation greatly to their advantage. They accordingly allowed no man to conſult the gods, before he had offered coſtly ſacrifices, and made rich preſents to them. And to keep up the veneration for their oracles, and to prevent their being taken unprepared, they admitted perſons to conſult the gods only at certain ſtated times; and ſometimes they were ſo cautious, that the greateſt perſons could obtain no anſwer at all. Thus Alexander himſelf was peremptorily denied by the pythia, or prieſteſs of Apollo, till ſhe was, by downright force, obliged to aſcend the tripos; when, being unable to reſiſt any longer, ſhe cried out, *thou art invincible*; and theſe words were accepted inſtead of a farther oracle. The principal oracles of antiquity were, 1. The oracle of Dodona, where there was a temple conſecrated to Jupiter: the prieſts who delivered theſe oracles were called ſelli; but in latter ages they were pronounced by three old women. Near the temple of Dodana was a ſacred grove of oaks, which were ſaid to be endued with a human voice, and a prophetical ſpirit; the reaſon of which fiction ſeems to have been, that the prieſts often concealed themſelves within the hollow of theſe trees, and from thence delivered oracles. 2. The oracle of olympian Jupiter at Elis. 3. The oracle of Apollo at Delphi, where it was pretended that an inſpiring vapour aroſe from the mouth of a deep cavern, on which the pythia being placed on a three legged ſtool, received the divine afflatus, and became inſpired: this oracle was the moſt famous of all others. 4. The oracle of Trophonius, at Lebadea, a city in Bœotia, at which, after a number of ceremonies were performed, the votary deſcended into Trophonius's cave, where future events were revealed to him in a very extraordinary manner. It is remarkable, that all who conſulted this oracle, ſeemed to be frighted out of their ſenſes; for ſome time after, they became penſive and melancholy, their tempers were ſoured, and their countenances, however gay and pleaſant before, were rendered dull and heavy. 5. The oracle of Amphiaraus, the anſwers of which were delivered in dreams, while the perſon ſlept on the ſkin of the victim he had ſacrificed. 6. That of Mercury, at Pharæ, a city of Achaia, where thoſe who wanted information, after offering frankincenſe upon the altar, and preſenting a piece of money, placed their ear to the ſtatue, and then ſtopping both ears till they were at ſome diſtance, took away their hands, and received the firſt voice they heard as a divine oracle. 7. The oracle of Hercules at Bura, where was a cave in which was placed the ſtatue of Hercules: here they who conſulted the god firſt addreſſed themſelves to him by prayer; then taking four dice out of a great heap that lay ready, they threw them upon the table, and as all the dice had particular marks, they were interpreted, and the anſwer given by conſulting a book kept for that purpoſe. 8. At Patræ, a city on the ſea-coaſt of Achaia, was a temple of Ceres,

before

before which was a fountain which delivered oracles only on the event of diſeaſes, by letting down a looking-glaſs ſo low, that the bottom might juſt touch the ſurface of the water; when from the various figures repreſented in it, conjectures were formed concerning the patient. Beſides theſe, there were ſeveral others, as that of Æſculapius at Epidaurus, that of Bacchus at Amphiclea, that of Orpheus's head, at Leſbos, &c.

ORACH, *atriplex*, in botany. See the article ATRIPLEX.

ORAL, ſomething delivered by word of mouth, without being committed to writing; in which ſenſe we ſay, oral law, oral tradition, &c.

ORAN, a city and port-town of Barbary, under the meridian of London: north lat. 36° 30′.

ORANGE-TREE, *aurantium*, in botany, See the article AURANTIUM.

Orange-flowers are juſtly eſteemed one of the fineſt perfumes; and though little uſed in medicine, yet the water diſtilled from them is accounted ſtomachic, cordial and carminative. The fruit is cooling and good in feveriſh diſorders, and particularly in diarrhœas. Orange-peel is an agreeable aromatic, proper to repair and ſtrengthen the ſtomach, and give a very grateful flavour to any infuſions or tinctures, into whoſe compoſitions they enter. Oranges and lemons pay, on importation, a duty of 3 s. 10$\frac{20}{100}$ d. the thouſand; and draw back, on exportation, 3 s. 4$\frac{1}{2}$ d.

ORANGE-COLOUR, among dyers, one that partakes equally of red and yellow. See the articles COLOUR and DYEING.

ORANGE, in geography, a city of Provence, in France, capital of the principality of Orange: it is ſituated on the eaſt ſide of the river Rhone, ſeventeen miles north of Avignon: eaſt long. 4° 46′, north lat. 44° 10′.

ORANGEADE, a drink made of orange-juice, water, and ſugar, ſaid to be good in fevers.

ORANGERY, in gardening, a gallery expoſed to the ſouth, but well cloſed with glaſs-windows, to preſerve orange-trees in winter.

It likewiſe denotes the parterre, where the orange-trees are expoſed in kindly weather.

ORATION, in rhetoric, a ſpeech or harangue, compoſed according to the rules of oratory, and ſpoke in public.

Orations may be all reduced to three kinds, *viz.* the demonſtrative, deliberative, and judicial. To the demonſtrative kind belong panegyrics, genethliaca, epithalamia, congratulations, &c. To the deliberative kind belong perſuaſion, exhortation, &c. And to the judicial kind belong accuſation, confutation, &c. See PANEGYRIC, GENETHLIACUM, &c.

Funeral ORATION. See FUNERAL.

ORATORIO, in the italian muſic, a ſort of ſacred drama of dialogues; containing recitativos, duettos, trios, ritornellos, choruſes, &c.

The ſubjects of theſe pieces are uſually taken from the ſcriptures, or from the life of ſome ſaint, &c.

The muſic for the oratorio ſhould be in the fineſt taſte, and beſt choſen ſtrains. Theſe oratorios are greatly uſed at Rome, in time of lent; and, of late, in England.

ORATORY, *oratoria*, the art of ſpeaking well, otherwiſe called rhetoric. See the article RHETORIC.

ORATORY, among the romaniſts, a cloſet or like apartment near a bed-chamber, furniſhed with an altar, crucifix, &c. for private devotion.

There are two congregations of religious, one in Italy, the other in France, which are called prieſts of the oratory; but it ought to be obſerved, that the members are not, properly ſpeaking, religious, being obliged to make no vows, and their inſtitute being purely eccleſiaſtical.

ORB, *orbis*, in aſtronomy, &c. denotes an hollow globe or ſphere. See the articles GLOBE and SPHERE.

ORBICULARE OS, in anatomy, a little bone of the ear, ſo called from its figure. See the article EAR.

ORBICULARIS, in anatomy, an appellation given to the conſtrictor-muſcle of the lips; as alſo to the conſtrictor of the upper eye-lid, which is ſingle, and riſes from the upper apophyſis of the maxillary bone, near the larger canthus of the eye, and ſurrounds the eye-lid with a ſeries of orbicular fibres, ſerving to ſhut it; and, in this action, it alſo depreſſes and draws forward the eye brow, and elevates the lower eye-lid.

Some alſo give the name of orbicularis inteſtini to the ſphincter of the anus.

ORBIS, the GLOBE-FISH, a name given to two ſpecies of oſtracion, nearly as broad as long, and covered with ſpines. See the article OSTRACION.

ORBIS MAGNUS, in aſtronomy, denotes the earth's orbit, in its annual revolution round the ſun.

ORBIT, *orbita*, in aſtronomy, the path of a planet or comet, or the curve that it deſcribes in its revolution round its central body: thus the earth's orbit is the curve which it deſcribes in its annual courſe, and uſually called the ecliptic. See the article ECLIPTIC.

The orbits of all the planets are ellipſes having the ſun in their common focus; in which curve they move according to the invariable law mentioned below.

However, the orbit of the earth is conſiderably disfigured by the action of the moon; as is alſo the orbit of ſaturn by the action of jupiter, when they happen to be in conjunction.

Though the orbits of the planets be elliptical, not circular, yet that they are very little ſo, even in the moſt excentric orbit, as that of mercury, will appear by comparing their excentricities with their mean diſtances from the ſun. Thus, ſuppoſe the mean diſtance of the earth from the ſun be divided into 1000 equal parts, then in thoſe parts we have, in

Merc. CS:DS:: 80: 387:: 1: 4,84
Venus, CS:DS:: 5: 723:: 1: 144,6
Earth, CS:DS:: 17: 1000:: 1: 19
Mars, CS:DS:: 141: 1524:: 1: 10,8
Jupiter, CS:DS:: 250: 5201:: 1: 20,8
Saturn, CS:DS:: 547: 9538:: 1: 17,4

It is found by experience, that the orbits of the planets are quieſcent, or that the line of the apſides A P (plate CLXXXIX. fig. 1. n° 1.) always keep one and the ſame poſition with reſpect to the fixed ſtars: and the aphelium, or point A, poſſeſſes different points in the ecliptic in the ſeveral orbits, as in the foregoing ſynopſis.

That the earth's orbit is elliptical, is well known from common experience; for were the orbit circular, the ſun's apparent diameter would always be the ſame; but we find it is not, for if it be meaſured with a micrometer in winter-time, it will be found conſiderably larger than in the ſummer, and it will be greateſt of all when the ſun is in the 8° of ♑ (which ſhews that is the place of the aphelium) it being then 32′ 47″; whereas, when the ſun is in the 8° of ♋, his diameter is but 31′ 40″.

Hence it is evident that the ſun is really nearer to us in the midſt of winter than in the midſt of ſummer; but this ſeems a paradox to many, who think the ſun muſt needs be hotteſt when it is neareſt to us, and that the ſun is apparently more diſtant from us in December than in June. As to the ſun's being hotter, it is true, it is ſo to all thoſe places which receive his rays directly or perpendicularly; but we find his heat abated on account of the obliquity of the rays, and his ſhort continuance above the horizon at that time. And, as to his diſtance, it is only with reſpect to the zenith of the place, not the center of the earth; ſince it is plain the ſun may approach the center of the earth, at the ſame time that it recedes from the zenith of any place.

Agreeably to the ſun's nearer diſtance in the winter, we obſerve his apparent motion is then quicker than in ſummer; for in the 8° of ♑ it is about 61′ per day, but in 8° of ♋ his motion is but 57′ per day. Accordingly, we find the ſummer half-year eight days longer than the winter half-year, as appears by the following computation, according to the new ſtyle.

Summer half year includes in		Winter half-year includes in	
March	10½ days	Sept.	7 days.
April	30	Oct.	31
May	31	Nov.	30
June	30	Dec.	31
July	31	Jan.	31
Auguſt	31	Feb.	28
Sept.	23	Mar.	20½
Sum. half.	186½		178½
Wint. half.	178½		

The difference 8 days.

For the ſun's attracting force being one part of the cauſe of the planet's motion, and this force always increaſing and decreaſing in the inverſe ratio of the ſquares of the diſtances, it is evident the velocity of the planet will always be greater the nearer it is to the ſun, and *vice verſa*. Hence the motion of a planet is every where unequable, being conſtantly accelerated as it paſſes from A by D to P; and in the other half, from P to A, it is retarded.

Yet is this unequal motion of a planet regulated by a certain immutable law, from which it never varies; which is, that a line, drawn from the center of the ſun to the center of the planet, does ſo move with the planet about the ſun, that it deſcribes elliptic area's always proportional to the times. That is, if when the planet moves ſloweſt, it deſcribes the arch A *d* in a given time; and when it moves quickeſt, it deſcribes the arch *b* P in the ſame time; then will the trilineal area A S *d* be equal to the other trilineal area *b* S P.

To demonſtrate this, let the time in which

which the planet moves through the periphery of its orbit to be divided into equal parts, and ſuppoſe that in the firſt part it deſcribed any right line A B (*ibid.* n° 2.) by the projectile force in any direction, and the centripetal force conjointly; then in the ſecond part of time it would proceed in the ſame right line to *c*, if nothing prevented; ſo that B *c* = A B, as is manifeſt from the firſt law of motion. Draw the right lines S B, S *c*, and the triangles A B S and B *c* S will be equal, as having equal baſes A B, B *c*, and the ſame altitude of the vertex S. But when the body comes to B, let the centripetal force act with a new impulſe either equal to the former or unequal, and let it cauſe the body to decline from the right line B *c*, and deſcribe the right-line B C; draw C *c* parallel to B S, meeting B C in C; and at the end of the ſecond part of time the body will be at C, and in the ſame plane with the triangle A S B. Join S C, and becauſe of the parallels S B and C *c*, the triangle S B C will be equal to the triangle S B *c*, and therefore equal to the triangle S A B. By the ſame way of reaſoning, if the centripetal force act ſucceſſively in the points C, D, E, cauſing the body in each equal part of time to deſcribe the right lines C D, D E, E F, &c. the triangles S C D, S D E, S E F, &c. will be equal, and all in the ſame plane.

In equal times, therefore, equal area's are deſcribed; and, by compoſition of ratio's, any ſums of area's S A D S, S A F S, are to each other as the times in which they are deſcribed. Let now the number of triangles be increaſed, and their breadth be diminiſhed in infinitum; then will their perimeter A D F be ultimately a curve: and, therefore, the centripetal force, by which the body is drawn perpetually from the tangent to this curve, acts inceſſantly; and the area's deſcribed are alſo in this caſe proportional to the times of their deſcription. Hence the velocity of the revolving body or planet is every where inverſely, as the perpendicular let fall from the center S to the tangent of the orbit in the place of the planet. For the velocities in the points A, B, C, &c. are as the baſes of the triangles A B, B C, C D, &c. as being the ſpaces deſcribed in the ſame time; and the baſes of equal triangles are reciprocally as their perpendicular altitudes; and, therefore, ſince in the evaneſcent triangles A S B, A S C, &c. the right lines A *c*, B *d*, C *e*, &c. become tangents to the curve in the points A, B, C, &c. it is manifeſt the velocity in theſe points will be inverſely, as a perpendicular from S let fall upon thoſe tangent-lines produced.

Hence alſo it follows, that the times in which equal arches are deſcribed in any planetary orbits are directly as thoſe perpendiculars, becauſe they are inverſely as the velocities.

ORBITELLO, a city and port-town of Italy, in the dutchy of Tuſcany, ſituated on a bay of the Mediterranean: eaſt long. 12°, north lat. 42° 30′.

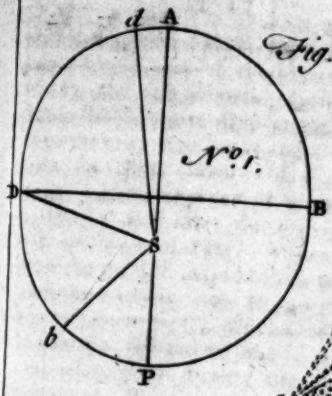
ORCADES, the ORKNEY-ISLANDS. See the article ORKNEY.

ORCELLE, or CANARY-WEED, in botany, a ſpecies of cladonia. See the article CLADONIA.

ORCHARD, a plantation of fruit-trees. In planting an orchard, great care ſhould be taken that the ſoil is ſuitable to the trees planted in it; and that they are procured from a ſoil nearly of the ſame kind, or rather poorer than that laid out for an orchard. As to the ſituation, an eaſy riſing ground, open to the ſouth-eaſt, is to be preferred. Mr. Miller recommends planting the trees fourſcore feet aſunder, but not in regular rows; and would have the ground between the trees plowed, and ſown with wheat and other crops, in the ſame manner as if it was clear from trees, by which means the trees will be more vigorous and healthy, will abide much longer and produce better fruit. If the ground has been paſture, the greenſward ſhould be plowed in the ſpring before the trees are planted; and if it be ſuffered to lie a ſummer fallow, it will greatly mend it, provided it be ſtirred two or three times to rot the graſs, and prevent the growing of weeds. At Michaelmas it ſhould be plowed pretty deep, in order to make it looſe for the roots of the trees, which if the ſoil be dry, ſhould be planted in October; but if it be moiſt, the beginning of March will be a better ſeaſon. If ſeveral ſorts of fruit-trees are to be planted on the ſame ſpot, you ſhould obſerve to plant the largeſt growing trees backwards, and ſo proceed to thoſe of leſs growth, continuing the ſame method quite through the whole plantation; by which means the ſun and air will more eaſily paſs through the whole orchard. When you have planted the trees, you ſhould ſup-

port

Fig. 1. ORBIT.



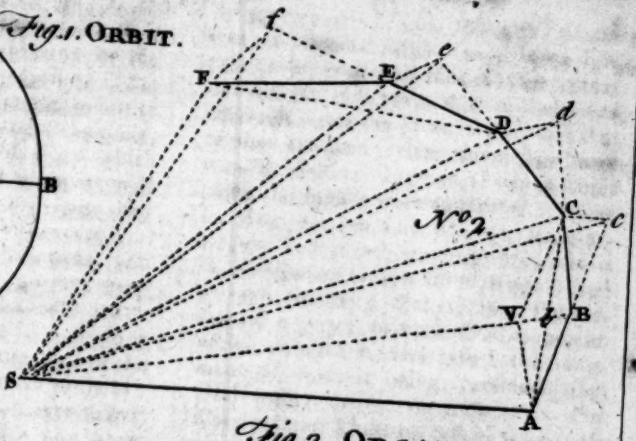
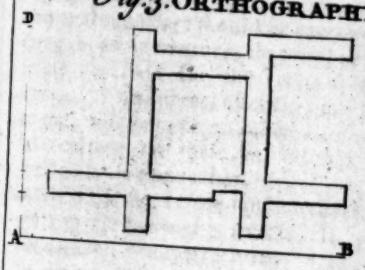


Fig. 2. ORGAN.

Fig. 3. ORTHOGRAPHY.



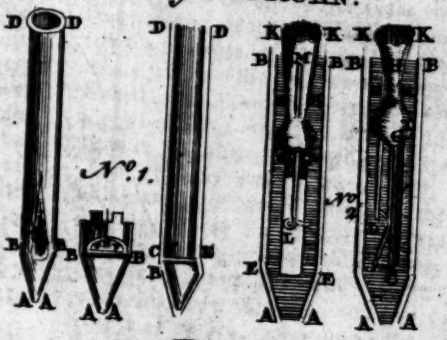


Fig. 4. Assaying OVEN.

Fig. 5. PALE.

Fig. 6. PALISSE.

J. Jefferys sculp.

BRITISH MUSEUM

port them with ſtakes, to prevent their being blown out of the ground by the wind; and the following ſpring, if the ſeaſon ſhould prove dry, cut a quantity of green turf, and lay it about the roots, with the graſs downwards; by which means a great expence of watering will be ſaved; and after the firſt year they will be out of danger. Whenever you plow the ground betwixt theſe trees, you muſt be careful not to go too deep amongſt their roots, which would greatly damage the trees; but if you do it cautiouſly, your ſtirring the face of the ground will be of great ſervice to them: though you ſhould obſerve, never to ſow too near the tree, nor ſuffer any great rooting weeds to grow about them; becauſe this would ſtarve them, by exhauſting the goodneſs of the ſoil, which every two or three years ſhould be mended with dung or other manure, that will be abſolutely neceſſary for the crops ſown between. Theſe trees, after they are planted out, will require no other pruning beſides cutting off their bad branches, or ſuch as croſs each other.

ORCHESTRA, in the antient theatres, a place in the form of a ſemi-circle, where the dancing was performed.

In the greek theatres, the orcheſtra made part of the ſtage; but, among the Romans, it anſwered nearly to our pit; only that, in it were diſpoſed the ſeats for the ſenators, magiſtrates, veſtals, and other perſons of diſtinction.

ORCHIES, a town of the French Netherlands, in the province of Flanders, twelve miles ſouth-eaſt of Liſle.

ORCHILLA, one of the Leeward-iſlands.

ORCHIS, FOOL'S-STONES, in botany, a genus of the gynandria-diandria claſs of plants, the corolla of which is of a corniculated form; and its fruit is an oblong unilocular capſule, containing numerous ſcobiform ſeeds.

Orchis-root abounds with a glutinous juice, good for blunting acrid ſerous humours: it is alſo accounted an aphrodiſiac, but on no good foundation.

ORDEAL, a form of trial, or of diſcovering innocence or guilt, formerly practiſed over almoſt all Europe, and which prevailed in England from the time of Edward the Confeſſor, till it was aboliſhed by a declaration of Henry III. It was called purgatio vulgaris, or judicium, in oppoſition to bellum or combat, the other form of purgation; and was of various kinds, as that of fire, that of red hot iron, that of water, that of judicial pottage, that of hallowed cheeſe, that of the green croſs, and that of dice laid on relics covered with a woollen cloth. To each of which kinds particular maſſes were appointed.

In England, an offender, on being arraigned and pleading not guilty, had it in his choice to put himſelf upon God and his country; that is, upon the verdict of a jury; or upon God alone, on which account it was called the judgment of God, it being preſumed that God would deliver the innocent. The more popular kinds of ordeal were thoſe of red-hot iron and water; the firſt for freemen and people of faſhion, and the laſt for peaſants. That by fire, as practiſed here, was the perſon's walking barefooted and blindfold over nine red-hot plough-ſhares; and if he eſcaped unhurt, he was acquitted, otherwiſe condemned. That of water was of two kinds, *viz.* either with hot water or cold; the former was where the perſon ſuſpected put his arm or leg into ſcalding water, and brought it out unhurt; and the latter was when his body was not, contrary to the courſe of nature, borne up by the water.

ORDER, in architecture, is a ſyſtem of the ſeveral members, ornaments and proportions of columns and pilaſters; or a regular arrangement of the projecting parts of a building, eſpecially the column, ſo as to form one beautiful whole.

M. Le Clerk defines an order to be a column charged with an entablature, and ſupported on a pedeſtal.

The origin of orders may be ſaid to be almoſt as antient as human ſociety. The rigour of the ſeaſons firſt put men upon making little cabbins to retire into: at the firſt they were made half under ground, and half above, and were covered with ſtubble; but, in time growing more expert, they placed trunks of trees on end, and laid others a-croſs, to bear up the covering. See the article ARCHITECTURE.

From hence they took the hint of more regular architecture, the trunks of trees upright repreſenting columns; and the girds or bands which ſerved to keep the trunks from burſting, expreſſed baſes and capitals; and the ſummers which lay a-croſs, gave the hint of entablatures; and likewiſe, the coverings, ending in points, gave a notion of pediments. This

hypotheſis we have from Vitruvius, and it has been well illuſtrated by M. Blondel. See the article COLUMN, &c.

Others are of the opinion that columns take their riſe from the pyramids which were erected by the antients over tombs; and that the urns wherein their aſhes were incloſed, repreſented the capitals, the abacus of which was a brick laid over to cover the urn: but Vitruvius's account ſeems the moſt natural. See the article ABACUS, &c.

In time, the height of columns, was regulated by the Greeks on the foot of the proportion of a human body. The doric repreſented a man of a ſtrong robuſt make, the ionic that of a woman, and the corinthian that of a girl; their baſes and capitals were their ſhoes, head dreſs, &c. The three Greek orders repreſent three different manners of building, *viz.* the ſolid, mean, and delicate; the two Italian ones are imperfect productions of theſe.

The little regard the Romans had for the laſt, appears from this, that we meet not with one inſtance in the antique where they are intermixed.

Daviler obſerves, that the abuſe the moderns have introduced by the mixture of the greek and latin orders, ariſes from their want of reflection on the uſe which the antients made thereof.

To give a general idea of the orders, it will be neceſſary to obſerve that the whole is compoſed of two parts, at leaſt, *viz.* the column and the entablature; and of four parts, at the moſt, where there is a pedeſtal under the columns, and one acroter or little pedeſtal on the top of the entablature.

That the column has three parts, *viz.* the baſe, the ſhaft, and the capital; the entablature has three likewiſe, *viz.* the architrave, the frieze, and the corniche; which parts are all different in the ſeveral orders, having each their particular characters and members called by the general names of mouldings or ornaments. See the article BASE, &c.

Theſe orders took their names from the people among whom they were invented. Scammozzi calls the tuſcan, the gigantic; the doric, the herculean; the ionic, the matronal; the compoſite, the heroic; and the corinthian, the virginal.

An order of columns is uſually underſtood of a column bearing its entablature; but the order is ſcarcely complete, except the column be raiſed on a pedeſtal. The pedeſtal, column, and entablature are three compound parts, each conſiſting of three others, as has been ſaid before. The antients have given us five ſeveral orders of columns, the tuſcan, doric, ionic, compoſite, and corinthian. See the articles TUSCAN, DORIC, &c.

Diſpoſition of the ORDERS. Theſe ought to be ſo diſpoſed in building, that the moſt ſolid may be placed undermoſt; as being the moſt proper to ſuſtain the weight, and to give the whole edifice a more firm foundation: therefore the doric muſt always be placed under the ionic, the ionic under the corinthian, and the corinthian under the compoſite. As to the tuſcan, being a plain rude order, it is ſeldom uſed above ground, except in villas, where one order only is employed. In very large buildings, as amphitheatres, where many orders are required, the tuſcan may be placed under the ionic inſtead of the doric. But if you are deſirous to leave out any of theſe orders, as for inſtance, to place the corinthian immediately over the doric, you may, provided you always obſerve to place the moſt ſtrong and ſolid undermoſt, for the reaſons above-mentioned.

As to the proportions, any height being given, divide it into ten equal parts, called diameters, or the thickneſs of the ſhaft at the bottom, for the tuſcan order; the pedeſtal having two, the column ſeven, and the entablature one and three quarters. The doric order contains twelve ſuch parts or diameters, and one third; the ionic, thirteen and an half; the corinthian, fourteen and an half; and the compoſite fifteen and a third ſuch parts, which are diſtributed as expreſſed in the figure of each. See the articles TUSCAN, DORIC, &c.

Intercolumniation of the ORDERS. See the article INTERCOLUMNIATION.

But beſides theſe regular orders, there are others to be met with; as the attic, gothic, perſian, ruſtic, &c. See the articles ATTIC, GOTHIC, &c.

ORDER is alſo uſed for a diviſion or claſs of any thing: thus, the tribe of animals called birds, is ſubdivided into ſix orders. See the article ORNITHOLOGY.

Holy ORDERS, a character peculiar to eccleſiaſtics, whereby they are ſet apart for the miniſtry. See ORDINATION.

Military ORDERS, are companies of knights, inſtituted by kings and princes; either for

for defence of the faith, or to confer marks of honour, and make diſtinctions among their ſubjects.

Religious ORDERS, are congregations or ſocieties of monaſtics, living under the ſame ſuperior, in the ſame manner, and wearing the ſame habit.

ORDERS of curves, in geometry. See the article CURVE.

ORDINAL, *ordinale*, a book containing the order, or manner of performing divine ſervice. See RITUAL.

ORDINAL NUMBERS. See NUMBER.

ORDINANCE, or ORDONNANCE, a law, ſtatute, or command of a ſovereign, or ſuperior: thus the acts of parliament are ſometimes termed ordinances of parliament.

ORDINARII, in antiquity, a ſort of gladiators. See GLADIATORS.

ORDINARY, in general, ſignifies, common, uſual; thus, an embaſſador or envoy in ordinary, is one ſent to reſide ſtatedly, and for a number of years, in the court of ſome foreign prince or ſtate, in order to keep up a good underſtanding, and watch over the intereſt of his own nation.

This term is alſo applied to ſeveral officers in the king's houſhold, who attend on common occaſions. Thus we ſay, phyſician in ordinary, *&c.*

ORDINARY, in civil law, is any judge inveſted with authority to take cognizance of cauſes in his own right, and not by deputation.

ORDINARY, in common and canon law, is one who has ordinary or immediate juriſdiction in eccleſiaſtical cauſes in ſuch a place. In which ſenſe archdeacons are ordinaries, tho' the appellation is more frequently given to the biſhop of the dioceſe, who has the ordinary eccleſiaſtical juriſdiction. The archbiſhop is the ordinary of the whole province, to viſit and receive appeals from inferior judicatures. The romiſh canoniſts call the pope ordinary of ordinaries, ſince by the lateran council he has uſurped the right of collating by prevention to all benefices, in excluſion of the ordinary collators.

ORDINARY *of aſſiſe and ſeſſions*, was a deputy of the biſhop of the dioceſe, antiently appointed to perform divine ſervice for malefactors, and aſſiſt in preparing them for death.

ORDINARY *of Newgate*, a clergyman, who attends in ordinary upon the malefactors in that priſon, preaches and reads prayers in the chapel to all the priſoners, and attends and prays with the condemned malefactors at the place of execution.

ORDINARY, or *honourable* ORDINARY, in heraldry, a denomination given to certain charges properly belonging to that art. The honourable ordinaries are ten in number; *viz.* the chief, pale, bend, feſſe, bar, croſs, ſaltier, chevron, bordure, and orle. For which ſee the articles CHIEF, PALE, *&c.*

ORDINATES, or ORDINATE APPLICATES, in geometry, are parallel lines, MM, *mm*, (plate CLXXXVIII. fig. 4.) terminating in a curve, and biſſected by a diameter, as AD. The half of theſe, as MP, *mp*, is properly the ſemi-ordinate, though commonly called ordinate. See the articles CURVE, PARABOLA, HYPERBOLA, *&c.*

ORDINATION, the act of conferring holy orders, or of initiating a perſon into the prieſthood by prayer, and the laying on of hands. Ordination has always been eſteemed the principal prerogative of biſhops, and they ſtill retain the function as a mark of ſpiritual ſovereignty in their dioceſe. Without ordination, no perſon can receive any benefice, parſonage, vicarage, *&c.* A clerk muſt be twenty-three years of age before he can have any ſhare in the miniſtry; and twenty-four, before he can be ordained, and by that means be permitted to adminiſter the ſacraments. A biſhop, on the ordination of clergymen, is to examine them in the preſence of the miniſters who aſſiſt him at the impoſition of hands; and in caſe any crime, as drunkenneſs, perjury, forgery, *&c.* be alledged againſt any one that is to be ordained, either prieſt or deacon, the biſhop ought to deſiſt from ordaining him. The perſon to be ordained is to bring a teſtimonial of his life and doctrine to the biſhop, and give an account of his faith in latin, and both prieſts and deacons are obliged to ſubſcribe the thirty-nine articles.

The ordination days in the church of England, are the four Sundays immediately following the Ember-weeks, *viz.* the firſt Sunday in Lent, Trinity-Sunday, and the Sundays following the firſt Wedneſday after Sept. 14. and Dec. 13.

In Scotland, where there are no biſhops, the power of ordination is lodged in the preſbytery. See PRESBYTER.

ORDNANCE, a general name for all ſorts of great guns, uſed in war. See the articles CANNON and GUN.

Office of ORDNANCE, an office kept within the Tower of London, which ſuperintends and diſpoſes of all the arms, inſtruments, and utenſils of war, both by ſea and land, in all the magazines, garriſons and forts in Great Britain.

The officers of the ordnance are, 1. The maſter-general, from whom are derived all orders and diſpatches relating to the ſame. 2. The lieutenant-general, who receives orders from the maſter-general, and ſees them duly executed; orders the firing of guns on days of rejoicing, and ſees the train of artillery fitted out when ordered to the field. 3. The ſurveyor-general, who has the inſpection of the ordnance, ſtores, and proviſions of war in the cuſtody of the ſtore-keepers: he allows all bills of debt, keeps a check on labourers, *&c.* 4. The treaſurer, thro' whoſe hands paſſes the money of the whole office, as well for payment of ſalaries as debentures; as alſo a clerk of the ordnance, and a clerk of the deliveries, for which ſee the articles CLERK *of the ordnance*, &c.

ORDONNANCE, in painting, is uſed for the diſpoſition of the parts of a picture, either with regard to the whole piece, or to the ſeveral parts; as the groups, maſſes, contraſts, *&c.*

In the ordonnance there are three things to be regarded, *viz.* the place or ſcene, the diſtribution, and the contraſt.

1. As to the firſt, regard is to be had to the diſpoſition of things which ſerve as a ground-work; and to the plan and poſition of bodies; under the former of which, comes the landſkip, whether an uninhabited place, where there is full liberty of repreſenting all the extravagancies of nature; or inhabited, where the ſigns of cultivation, *&c.* muſt be exhibited. See the article LANDSKIP.

As to the plan of bodies, they are either ſolid, which again are either ſo by nature, and muſt be proportioned to their places; or artificial, where regard muſt be had to the rules of geometry, perſpective, architecture, *&c.* Or the bodies move; which they do either by a voluntary motion, wherein great regard muſt be had to proportion them to their ſituation, and to ſtrengthen them by regarding the equilibrium; or by ſome extraordinary power, as machines, *&c.* where the cauſes of their motion muſt appear. Or they are things at a diſtance, in all which an even plane muſt ſtill be propoſed, to find their preciſe ſituation, and ſettle their place by ſudden breaks and diſtances agreeably to perſpective.

In placing the figures, regard is to be had, 1. to the group, which connects the ſubject, and ſtays the ſight. In this are to be conſidered the knot or nodus, which binds the group, and the nearneſs of figures which as it holds them together, may be called the chain: that the group be ſuſtained by ſomething looſe and diſtinct from it, and by the ſame joined and continued to the other groups; and that the lights and ſhadows be ſo diſpoſed, as that the effects of all the parts of a compoſition may be ſeen at once. See the article GROUP.

2. As to the actions, forced attitudes are to be avoided, and ſimple nature ſhould be ſhewn in her moſt advantageous poſtures.

3. As to the drapery, which is to be adjuſted, ſo as it may appear real garments, and not ſtuff looſely thrown on. See the article DRAPERY.

4. In the contraſt, are to be conſidered the actions, which vary infinitely; the aſpects which in actions of the ſame kind, may, by their difference, make a contraſt; the ſituation, according as they meet above, or under the ſight, or are near or at a great diſtance. And laſtly, cuſtom, which indeed extends to all the parts of painting: tho' this is particularly to be regarded in the ordonnance, it is nevertheleſs to be followed with diſcretion, taking care to avoid all ſtiffneſs and formality.

ORDONNANCE, in architecture, is the compoſition of a building, and the diſpoſition of its parts, both with regard to the whole, and to one another; or as Mr. Evelyn expreſſes it, determining the meaſure of what is aſſigned to the ſeveral apartments. Thus ordonnance is the judicious contrivance of the plan or model; as when the court, hall, lodgings, *&c.* are neither too large nor too ſmall, but the court affords convenient light to the apartments about it: the hall is of fit capacity to receive company; and the bed chambers, *&c.* of a proper ſize. When theſe diviſions are either too great or too ſmall, with reſpect to the whole, as where there is a large court to a little houſe, or a ſmall hall to a magnificent palace, the fault is in the ordonnance.

ORDUNNA, a port-town of Spain, in the province of Biſcay: weſt long. 3° 30′, north lat. 43° 15′.

ORE, in natural hiſtory, the compound mineral glebe, earth, ſtone, or other ſubſtance; which is rich enough in metallic particles, to be worth the while of being purified; and by this means to ſeparate the metal from it, whether gold, ſilver, copper, iron, tin, &c. See the articles METAL, GOLD, SILVER, &c.

Ores then are nothing but natural concretes, of metals or ſemi-metals, mixed with ſulphur or arſenic, or with both together; and when ſuch alliances are made by art, we then ſay, that the metals, or ſemi-metals are reduced to the ſtate of ores. Some ores are ſo kindly as to melt readily of themſelves; whereas others are ſo intractable, that they require the aſſiſtance of various fluxes, before they will yield the metal. See the article FLUX.

Aſſayers therefore diſtinguiſh ores into fuſible, refractory, and not fuſible at all. Thoſe are called fuſible, which, either by means of a middling fire only, or by adding a fit menſtruum to them, melt eaſily, ſo as to afford the metal or ſemi-metal contained in them. The refractory ores are thoſe, which require a very ſtrong and laſting action of the fire, and the addition of proper fluxes, before they will melt in the requiſite manner.

All ores lie hidden in earths, ſtones, or in other minerals, as in matrices: if then theſe matrices of themſelves melt in the fire with very great difficulty, or not at all, the ore contained in them may indeed of its own nature be put in fuſion; but yet cannot be delivered of its matrix, becauſe this is not fuſible: ſuch are iron-ore, and almoſt all earths and ſtones, except the vitrifiable ones; but lime-ſtone in particular, and ſtones affected in the ſame manner in the fire, render the ores intermixed with them the moſt ſtubborn of any. Some of theſe ſtones, however, being much lighter than the ores, may be eaſily ſeparated by only pounding, waſhing, and extinguiſhing them in water; or by a previous calcination, leaving the weightier particles of the ore at the bottom of the veſſel, or trough: theſe kinds of ores are called decantable; as thoſe ores are called indecantable, which cannot be ſeparated in this manner; and of this laſt ſort are the light brittle ores, that contain a great quantity of ſulphur. Finally, if there is in the body of the ore itſelf any thing intangled, or only adhering to its outſide, that will cauſe the metal contained in it to vaniſh into a vapour, or turn it to ſcoria with itſelf, while the ore is expoſed to the fire; then ſuch an ore is ſaid to be hungry, *minera rapax*; the cauſes of this are commonly arſenic, antimony, and thoſe minerals out of which zinc is produced.

OREBRO, the capital of the province of Nericia, in Sweden; eaſt long. 15°, north lat. 59° 20′.

OREGRUND, a port-town of Sweden, in the province of Upland: eaſt long. 18° 15′, north lat. 60° 30′.

ORENSE, or ORTENSE, a city of Spain, in the province of Gallicia: weſt long. 8° 20′, north lat. 42° 36′.

ORFA, a town of Aſiatic Turky, in the province of Diarbec: eaſt long 40°, north lat. 36° 15′.

ORFORD, a borough and port-town of Suffolk, thirty miles eaſt of Bury. It ſends two members to parliament.

ORGAL, among dyers, denotes the lees of wine dried. See DYEING.

ORGAN, ὄργανον, in general, is an inſtrument, or machine deſigned for the production of ſome certain action or operation; in which ſenſe, the mechanic powers, machines, and even the veins, arteries, nerves, muſcles, and bones of the human body, may be called organs. See the articles POWER, MACHINE, VEIN, ARTERY, &c.

The organs of ſenſe are thoſe parts of the body, by which we receive the impreſſions or ideas of external objects; being commonly reckoned five, *viz.* the eye, ear, noſe, palate, and cutis. See the articles SENSE, EYE, EAR, &c.

ORGAN, in muſic, the largeſt and moſt harmonious wind-inſtrument.

The invention of the organ is very antient, though it is agreed that it was very little uſed till the eighth century. It ſeems to have been borrowed from the Greeks. Vitruvius deſcribes an hydraulic one in his tenth book of architecture. The emperor Julian has an epigram in its praiſe. St. Jerome mentions one with twelve pair of bellows, which might be heard a thouſand paces, or a mile; and another at Jeruſalem, which might be heard at the mount of Olives.

There is one in the cathedral church of Ulm, in Germany, that is ninety-three feet high; and twenty-eight broad; the biggeſt pipe is thirteen inches in diameter, and it has ſixteen pair of bellows.

The modern organ is a buffet, containing

ſeveral

ſeveral rows of pipes. The ſize of the organ is generally expreſſed by the length of its biggeſt pipe; thus we ſay an organ of thirty-two feet, of ſixteen, of eight, and of two feet.

Church organs conſiſt of two parts, *viz.* the main body, called the great organ; and the poſitive, or little organ, which is a ſmall buffet, commonly placed before the great organ.

The organ has at leaſt one ſet of keys, when it has only one body, and two or three when it has a poſitive or chair-organ: though large organs have four, and ſometimes five ſets of keys; beſides which, the pedals or largeſt pipes have their keys, the ſtops or touches whereof are played by the feet. The keys of an organ are uſually divided into four octaves, *viz.* the ſecond ſub-octave, firſt ſub-octave, middle octave, and firſt octave. Each octave is divided into twelve ſtops or frets, whereof the ſeveral black ones mark the natural ſounds, and the five white, the artificial ones, that is, the ſharps and flats; ſo that the keys uſually contain forty-eight ſtops, or touches. Some organiſts add to this number one or more ſtops in the third ſub-octave as well as in the ſecond. (Note, ſome harpſichords and ſpinnets have their natural ſtops or keys often marked white, and their artificial ones black.) The pedals have about two or three octaves, at the pleaſure of the organiſt, ſo that the number of ſtops is indeterminate.

Each key or ſtop preſſed down, opens a valve or plug which correſponds lengthwiſe with as many holes as there are rows of pipes on the ſound-board: the holes of each row are opened and ſhut by a regiſter, or ruler, pierced with forty-eight holes; by drawing the regiſter, the holes of one row are opened, becauſe the holes therein correſpond with thoſe of the ſound-board, ſo that by opening a valve, the wind brought into the ſound-board, by a large pair of bellows, finds a paſſage into the pipes, which correſpond to the open holes of the ſound-board; but by puſhing the regiſter, the forty-eight holes thereof not anſwering to any of thoſe of the ſound-board, that row of pipes anſwering to the puſhed regiſter are ſhut. Whence it follows, that by drawing ſeveral regiſters, ſeveral rows of pipes are opened; and the ſame thing happens, if the ſame regiſter correſpond to ſeveral rows. Hence the rows of pipes become either ſimple or compound: ſimple, when only one row anſwers to one regiſter; compound, where ſeveral. The organiſts ſay, a row is compound, when ſeveral pipes play upon preſſing one ſtop.

The pipes of the organ are of two kinds; the one with mouths like our flutes; the other with reeds. The firſt, called pipes of mutation, conſiſt, 1. of a foot, A A B B (pl. CLXXXIX. fig. 2. n° 1.) which is a hollow cone, and which receives the wind that is to ſound the pipe. 2. To this foot is faſtened the body of the pipe B B D D. Between the foot and the body of the pipe is a diaphragm, or partition, F E F, which has a long, but narrow aperture to let the wind out. Over this aperture is the mouth B B C; whoſe upper lip C, being level, cuts the wind as it comes out at the aperture.

The pipes are of pewter, of lead mixed with a twelfth part of tin, and of wood. Thoſe of pewter are always open at their extremities: their diameter is very ſmall, and their ſound very clear and ſhrill. Thoſe of lead, mixed with tin, are larger; the ſhorteſt open, the longeſt are quite ſtopped; the mean ones partly ſtopped, and having beſides a little ear on each ſide the mouth, to be drawn cloſer, or ſet farther aſunder, in order to raiſe or lower the ſound. The wooden pipes are made ſquare, and their extremity ſtopped with a valve, or tampion of leather. The ſound of the wooden and leaden pipes is very ſoft; the large ones ſtopped, are uſually of wood; the ſmall ones of lead. The longeſt pipes give the greateſt ſound; and the ſhorteſt, the moſt acute: their lengths and widths are made in the reciprocal ratio's of their ſounds; and the diviſions regulated by their rule, which they call diapaſon. But the pipes that are ſhut, are of the ſame length as the open ones, which yield the ſame ſound. Uſually, the longeſt pipe is ſixteen feet: though in extraordinary organs it is thirty-two. The pedal tubes are always open, though made of wood, and of lead.

A reed-pipe conſiſts of a foot, A A B B, (*ibid.* n° 2.) which carries the wind into the ſhalot, or reed C D, which is a hollow demi-cylinder, fitted at its extremity D, into a kind of mould, by a wooden tampion G. The ſhalot is covered with a plate of copper, K K I I, fitted at its extremity I I, into the mould by the ſame wooden tampion. Its other extremity

K K,

KK, is at liberty; ſo that the air entering the ſhalot, makes it tremble or ſhake againſt the reed; and the longer that part of the tongue which is at liberty I L, is made, the deeper is the ſound. The mould I I, which ſerves to fix the ſhalot or reed, the tongue, tampion, &c. ſerves alſo to ſtop the foot of the pipe, and to oblige the wind to go out wholly at the reed. Laſtly, in the mould is ſoldered the tube H H, whoſe inward opening is a continuation of that of the reed. The form of this tube is different in the different ranks of pipes. The degree of acuteneſs and gravity in the ſound of a reed-pipe, depends on the length of the tongue, and that of the pipe C K, taken from the extremity of the ſhalot, to the extremity of the tube. The quality of the ſound depends on the width of the reed, the tongue, and the tube; as alſo on the thickneſs of the tongue, the figure of the tube, and the quantity of wind.

To diverſify the ſounds of the pipes, they add a valve to the port-vent, which lets the wind go in fits or ſhakes.

Hydraulic ORGAN, denotes a muſical machine that plays by means of water inſtead of wind. Of theſe there are ſeveral in Italy in the grottoes of vineyards. Cteſebes of Alexandria, who lived in the time of Ptolemy Evergetes, is ſaid to have firſt invented organs that played by compreſſing the air with water, as is ſtill practiſed. Archimedes and Vitruvius have left us deſcriptions of the hydraulic organ.

In the cabinet of queen Chriſtina is a beautiful and large medallion of Valentinian, on the reverſe whereof is ſeen one of theſe hydraulic organs; with two men, one on the right, the other on the left, ſeeming to pump the water which plays it, and to liſten to its ſound. It has only eight pipes, placed on a round pedeſtal.

ORGANICAL, in the antient muſic, was that part performed by inſtruments. See the article MUSIC.

The organical comprehended three kinds of inſtruments, *viz.* the wind inſtruments, as trumpets, flutes, hautboys, &c. ſtringed inſtruments, as lutes, lyres, violins, harpſichords, &c. and pulſative inſtruments, or thoſe played by beating with the hands or ſticks, as drums, &c. See the ſeveral articles TRUMPET, &c.

ORGANICAL PART, is that part of an animal or plant, deſtined for the performance of ſome particular function.

ORGANICAL DISEASE, a diſeaſe in an organical part of the body, whereby its function is impeded, ſuſpended, or deſtroyed.

ORGANICAL *deſcription of curves*, the method of deſcribing them on a plane by means of inſtruments. See CURVE.

ORGANO, in muſic, ſignifies the thorough baſs. It is uſually ſcored with figures over the notes for the harpſichord, baſs-viol, and lute.

ORGANO PICCIOLO, a chamber or little organ, uſed to play in a ſmall room; being about two or three feet high, that is, its largeſt pipe is that length: it is made in a ſmall buffet like the poſitive, or little organ of a church. See ORGAN.

ORGASM, *orgaſmus*, an ecſtacy, or impetuous deſire of coition, occaſioned by a turgeſcency of the ſeminal veſſels. Certain female animals have an orgaſm at particular ſeaſons of the year.

ORGIA, ὄργια, in antiquity, feaſts and ſacrifices performed in honour of Bacchus, inſtituted by Orpheus, and chiefly celebrated on the mountains by wild, diſtracted women, called bacchæ. See BACCHANALIA and DIONYSIA.

ORGIVA, a town of Spain, in the province of Granada, twenty-five miles ſouth of Granada.

ORGUES, in the military art, are thick, long pieces of wood pointed at one end, and ſhod with iron, clear one of another; hanging each by a particular rope, or cord, over the gate-way of a ſtrong place, perpendicularly, to be let fall in caſe of an enemy. Their diſpoſition is ſuch, that they ſtop the paſſage of the gate, and are preferable to herſes or portcullíſes; becauſe theſe may be either broke by a petard, or they may be ſtopped in their falling down; but a petard is uſeleſs againſt an orgue, for if it break one or two of the pieces, they immediately fall down again, and fill up the vacancy; or if they ſtop one or two of the pieces from falling, it is no hindrance to the reſt.

ORGUES is alſo uſed for a machine, compoſed of ſeveral harquebuſs or muſquet-barrels, bound together, by means whereof ſeveral exploſions are made at the ſame time, uſed to defend breaches and other places attacked.

ORGYA, an antient grecian meaſure, containing ſix feet. See MEASURE.

ORIA, a town of Italy, in the kingdom of Naples, and territory of Otranto, ſituated

ated thirty miles north-weſt of the city of Otranto.

ORICHALCUM, or AURICHALCUM, braſs. See the article BRASS.

It is evident, from all accounts, that the orichalcum of the antients was a fictitious ſubſtance, not a natural metal: they made it on the ſame baſis that we make braſs at preſent, but they had ſeveral ways of doing it, and diſtinguiſhed it into ſeveral kinds. They had a white ſort in frequent uſe and great eſteem: this was made by mixing an earth with copper while in fuſion, but what that earth was we are not informed. We know ſeveral ways of turning copper white; one of which was much practiſed ſome years ago, and ſpoons, and other utenſils made of it, had the name of alchymy-things: but this was done by means of arſenic, a thing not known to the antients: this therefore could not be the ſame with their white braſs; and indeed, none of our methods ſeem to be the ſame with theirs, ſince the metal is debaſed by all ours, and becomes brittle, whereas in their management, according to their own accounts, it ſeems not to have loſt any thing of its ductility, though it acquired a particular brightneſs. The orichalcum and æs flavum, braſs and yellow copper, are with us ſynonymous terms, but with the antients they were uſed to expreſs different combinations of the ingredients.

ORIENT, *orient*, in geography and aſtronomy, the eaſt, or eaſt-point of the horizon; thus called, becauſe it is the point where the ſun riſes. Hence the equinoctial orient is uſed for that point of the horizon wherein the ſun riſes, when he is in the equator, or when he enters the ſigns of aries and libra; æſtival orient, is the point wherein the ſun riſes in the middle of ſummer, when the days are longeſt; and the hibernal orient, the point where the ſun riſes in the middle of winter, when the days are ſhorteſt.

ORIENTAL, ſomething ſituated towards the eaſt with regard to us, in oppoſition to occidental. See OCCIDENT.

ORIFICE, the mouth, or aperture of a tube, pipe, or other cavity.

In anatomy, this term is particularly applied to the mouths of the ſeveral ducts, veſſels, and other cavities, as of the bladder, uterus, ſtomach, *&c.* See the article BLADDER, *&c.*

It is alſo uſed for the aperture of a wound, or ulcer. See WOUND and ULCER.

ORIGANUM, WILD MARJORAM, in botany, a genus of the didynamia-gymnoſpermia claſs of plants, the corolla whereof conſiſts of a ſingle ringent petal, the tube is cylindric and compreſſed, the upper lip is erect, obtuſe, and emarginated, and the lower divided into three ſegments; there is no pericarpium, the cup is connivent, and contains four roundiſh ſeeds.

This plant is heating, diſſolving, and ſtimulating; whence it is of uſe in exulceration of the lungs, *&c.* It is alſo adapted to diſeaſes of the kidneys, and is balſamic.

ORIGENISTS, in church-hiſtory, a chriſtian ſect in the fourth century, ſo called from their drawing their opinions from the writings of Origen. The origeniſts maintained, that the ſouls of men had a pre-exiſtent ſtate, that they were holy intelligences, and had ſinned in heaven before the body was created: that Chriſt is only the ſon of God by adoption, that he has been ſucceſſively united with all the angelical natures, and has been a cherub, a ſeraph, and all the celeſtial virtues, one after another; that in future ages, he will be crucified for the ſalvation of the devils, as he has already been for that of men, and that their puniſhment, and that of the damned, will continue only for a certain limited time.

ORIGINAL, a firſt draught or deſign of any thing, which ſerves as a model to be imitated or copied.

ORIGINAL SIN, the crime of eating the forbidden fruit, of which it is ſaid, all mankind are guilty at their conception by the imputation of Adam's tranſgreſſion; which is accounted for by ſuppoſing that Adam, as he was to be the father, was alſo the fœderal head, and repreſentative of the whole human race; and that on his ſinning, all that were to ſpring from him partook of his crime. Father Malebranche endeavours to account for original ſin from natural cauſes, and ſuppoſes that our firſt parents, after their tranſgreſſion, received ſuch deep traces in their brain by the impreſſion of ſenſible objects, that it was very poſſible they might communicate them to their children; and that as, according to the order eſtabliſhed by nature, the thoughts of the ſoul are conformable to the traces in the brain, it may be ſaid, that as ſoon

as

BRITISH MUSEUM

ORNITHOLOGY.

T. Jefferys sculp.

is we are formed in the womb, we are infected with the corruption of our parents: for having traces in the brain like those who gave us being, we neceſſarily have the ſame thoughts, and the ſame inclinations with regard to ſenſible objects; and that thus, of courſe, we muſt be born with concupiſcence and original ſin. See the article CONCUPISCENCE.

ORIGINALIA, in the exchequer, are tranſcripts, &c. ſent to the remembrancer's office out of the court of chancery: which are thus called, to diſtinguiſh them from the records, which contain the judgments and pleadings in cauſes tried before the barons.

ORIGUELLA, a city of Spain, in the province of Valencia: weſt long. 50′, north lat. 38° 20′.

ORILLON, in fortification, is a ſmall rounding of earth faced with a wall; raiſed on the ſhoulder of thoſe baſtions that have caſemates, to cover the cannon in the retired flank, and prevent their being diſmounted by the enemy. See the articles BASTION and FORTIFICATION.

ORION, in aſtronomy, a conſtellation of the ſouthern hemiſphere; conſiſting of thirty-ſeven ſtars, according to Ptolemy; of ſixty-two, according to Tycho; and of no leſs than eighty, in the Britannic catalogue.

ORION'S RING, in aſtronomy, a conſtellation more uſually called eridanus. See the article ERIDANUS.

ORISTAGNI, a city and port-town of the iſland of Sardinia: eaſt long. 8° 30′, north lat. 39° 30′.

ORIXA, the capital of the province of the ſame name, in the hither India, ſituated on the weſt ſide of the bay of Bengal.

ORKNEY ISLANDS, certain iſlands on the north of Scotland, from which they are ſeparated by a frith twenty miles in length, and ten in breadth. Theſe iſlands are forty in number, and together with the iſland of Zetland ſend one member to parliament, and another for the burghs of Kirkwall, &c.

ORLAMUND, or ORLAMUNDA, a town of Germany, in the circle of Upper Saxony, fifty miles ſouth-weſt of Leipſic.

ORLE, ORLET, or ORLO, in architecture, a fillet under the ovolo or quarter round of a capital. When it is at the top or bottom of the ſhaft, it is called cincture. See the article CINCTURE.

Paladio uſes the word orlo, for the plinth of the baſes of the columns.

ORLE, in heraldry, an ordinary in form of a fillet drawn round the ſhield, near the edge or extremity thereof, leaving the field vacant in the middle. Its breadth is but half that of the treſſure or bordure, which contains a ſixth part of the ſhield; and the orle, only a twelfth; beſides that the orle is its own breadth diſtant from the edge of the ſhield, whereas the bordure comes to the edge itſelf. The form of the orle is the ſame with that of the ſhield, whence it reſembles an eſcutcheon. See pl. CLXXXVIII. fig. 5. which repreſents an orle argent in a field gules.

ORLEANOIS, a province or government of France, bounded by Normandy and the iſle of France, on the north; by Champaign and Burgundy, on the eaſt; by Lyonois and Guienne, on the ſouth; and by Britany and the bay of Biſcay, on the weſt.

ORLEANS, a city of France, capital of Orleanois, ſituated on the river Loire, in eaſt long. 2°, north lat. 47° 55′.

ORLEANS is alſo the name of an iſland and town on the river of St. Laurence, in Canada: weſt longitude 73°, north latitude 47°.

ORLOPE, in the ſea-language, the uppermoſt ſpace or deck in a great ſhip, reaching from the main-maſt to the mizen. In three-deck ſhips the ſecond and loweſt decks are ſometimes called orlopes.

ORMOND, the north diviſion of the county of Tipperary, in Ireland.

ORMSKIRK, a market-town of Lancaſhire, ſituated twenty-ſix miles ſouth of Lancaſter.

ORMUS, an iſland at the entrance of the gulph of Perſia, ſituated oppoſite to Gombron on the continent, in eaſt long. 56°, north lat. 27° 30′.

This iſland is thirty miles in circumference.

ORNAMENTS, in architecture, are uſed to ſignify all the ſculpture or carved-work wherewith a piece of architecture is enriched.

Vitruvius and Vignola alſo uſe the word to ſignify the entablature.

Ornaments in relievo, are thoſe cut in the contours of the mouldings, as leaves, ſhells, ſcrolls, flowers, &c.

Ornaments in creux, are ſuch as are cut within the mouldings, as eggs, flutes, &c. See the article MOULDING.

ORNITHOGALUM, STAR OF BETHLEHEM, in botany, a genus of the hexandria monogynia claſs of plants, the corolla whereof conſiſts of ſix petals, of a

lanceolated figure, from the baſe to the middle erect, from thence to the points planopatent; they are permanent, but loſe their colour: the fruit is a round angulated capſule, formed of three valves, and containing three cells: the ſeeds are numerous and roundiſh, the receptacle columnar.

The root of this plant is uſed both crude and boiled; and the ſeed is baked along with bread.

ORNITHOLOGY, that branch of zoology, which treats of birds. See BIRD. Linnæus, whoſe ornithology we have chiefly followed, arranges the whole claſs of birds under ſix orders, according to the different figures of their beaks, *viz.*

1. The accipitres, or birds with uncinated or hooked beaks. See plate CXC. fig. 1.

2. The picæ, or birds that have convex and compreſſed beaks, like that repreſented, *ibid.* fig. 2.

3. The anſeres, comprehending ſuch birds as have depreſſed, and dentated or ſerrated beaks, *ibid.* n° 3.

4. The ſcolopaces, or thoſe furniſhed with ſubcylindric and obtuſe beaks. See *ibid.* fig. 5.

5. The gallinæ, or birds which have the beak of a conic form, but crooked, and the upper chap imbricated. *ibid.* fig. 5.

6. The paſſeres, or birds with conic and ſharp-pointed beaks, like that repreſented *ibid.* fig. 6.

In the deſcription of birds, the feet, wings, and tail, are chiefly attended to.

In moſt birds the toes are four in number, three ſtanding forwards, and one backwards, as repreſented *ibid.* fig. 7, 8, 9. In ſome two toes ſtand forward, and two backward, *ibid.* fig. 10. Some feet, again, are palmated, or have the toes connected together by a membrane, *ibid.* fig. 9. and others ſemi-palmated. *ibid.* fig. 8.

With regard to the wings, the long quill-feathers, marked 1, 2, 3, &c. fig. 12. are called by authors remiges, as ſerving to fly with; and the other feathers, placed over the reſt of the body, tectrices. The long feathers of the tail are called rectrices, as ſerving to ſteer the bird's courſe through the air. *ibid.* fig. 11.

As to the other terms made uſe of in the deſcription of birds, they are theſe: cera expreſſes the membrane or naked tunic, which ſurrounds and extends itſelf over more or leſs of the baſe of the beak; urrhopigium is the rhump; and as to other terms, they will be found explained under their ſeveral heads.

ORNITHOMANCY, a ſpecies of divination, performed by means of birds; being the ſame with augury. See the articles DIVINATION and AUGURY.

ORNITHOPUS, BIRD'S FOOT, in botany, a genus of the diadelphia-decandria claſs of plants, with a papilionaceous flower: its fruit is an oblong, jointed pod, of a cylindrical figure, and containing in each joint a ſingle roundiſh ſeed: add to this, that ſeveral of theſe pods uſually grow together.

The leaves of this plant are ſaid to be good for an hernia, and for breaking and expelling the ſtone of the kidneys or bladder.

OROBANCHE, BROOM-RAPE, in botany, a genus of the didynamia-angiospermia claſs of plants, the corolla of which is monopetalous and ringent; and its fruit an oblong capſule formed of two valves, and containing a great many minute ſeeds.

The leaves of this plant, dried, and reduced to a powder, afford great relief in extreme pains of the colic; and its ſyrup is recommended againſt the hypochondriac affection.

OROBUS, BITTER-VETCH, in botany, a genus of the diadelphia-decandria claſs of plants, with a papilionaceous flower, and a rounded bivalve pod for its fruit, containing numerous roundiſh ſeeds.

It agrees in virtues with ervum. See the article ERVUM.

ORONOQUE, a river of South America, which falls into the Atlantic ocean in 8° north lat. almoſt oppoſite the iſland of Trinity.

ORONTIUM, in botany, a genus of the hexandria monogynia claſs of plants, whoſe calyx is a ſingle cylindric ſpadix, covered with floſcules; the corolla conſiſts of ſix permanent roundiſh petals; the fruit is a ſmall follicle, immerſed in the ſpadix with the corolla, and containing a roundiſh, fungous, and ſingle ſeed.

ORPELLO, in the glaſs-trade, calcined bark reduced to a black powder.

OROPESA, a town of New Caſtile, fifty miles weſt of Toledo.

OROPEZA, a city of Peru: weſt long. 66°, ſouth lat. 20°.

ORPHAN,

BRITISH
MUSEUM

ORRERY.

Fig. 1.

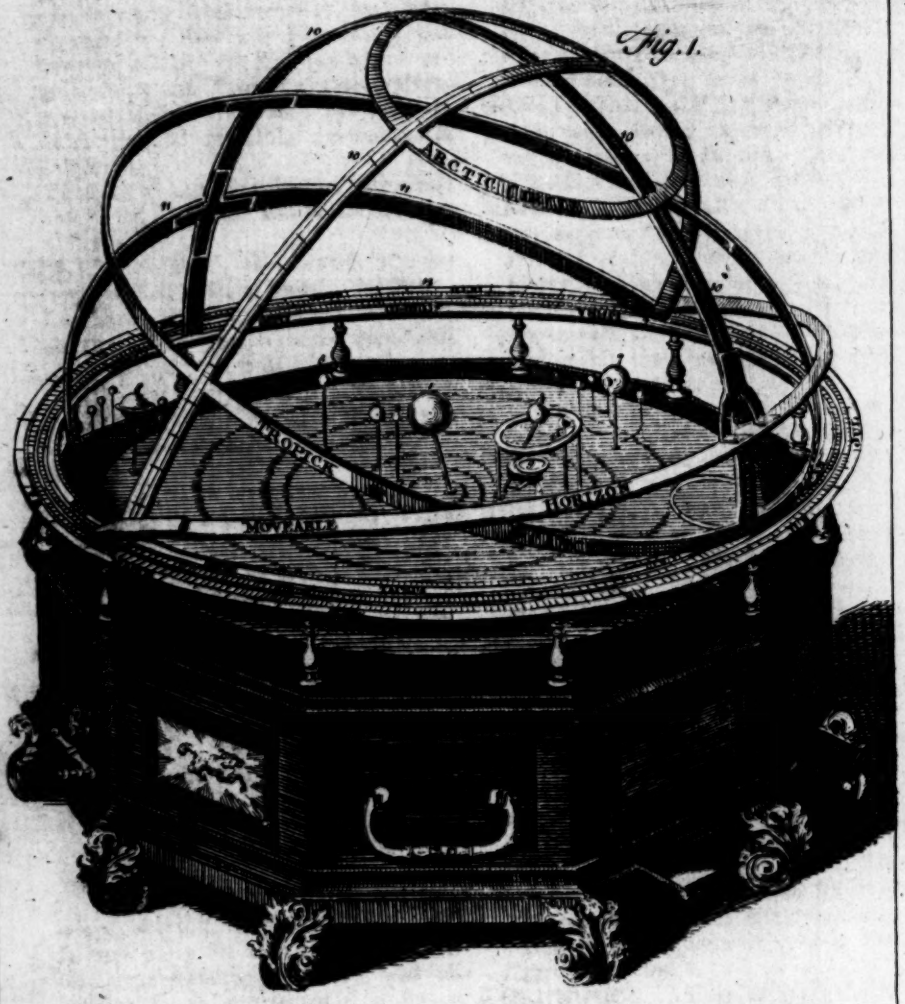
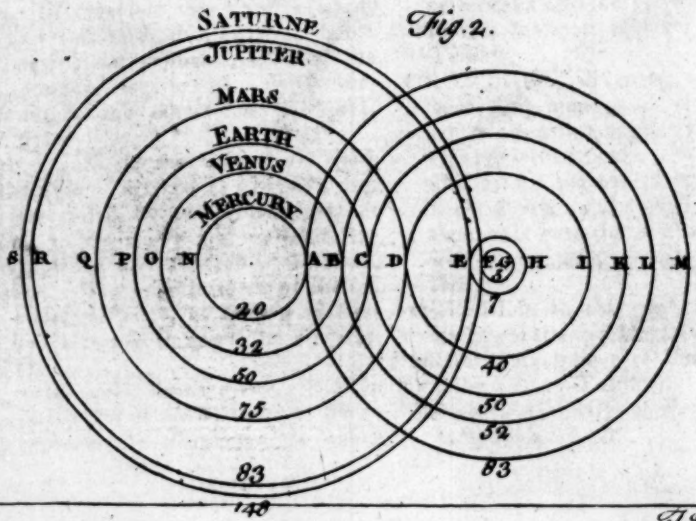


Fig. 2.



J. Jefferys sculp.

ORPHAN, a fatherleſs child, or minor; or one that is deprived both of father and mother.

The lord mayor and aldermen of the city of London have the cuſtody of the orphans of deceaſed freemen, and alſo the keeping of their lands and goods. Accordingly, the executors of ſuch freemen are to exhibit true inventories of their eſtates, and give ſecurity to the chamberlain of London for the orphan's part.

By ſtatute of 5 and 6 Will. and Mary, c. 10. a certain fund is to be applied for the payment of debts due to orphans, by intereſt at 4 *per cent.* And no perſon is compellable to pay into the chamber of London, any ſum of money or perſonal eſtate, belonging to the orphan of any freeman for the future.

ORPHUS, in ichthyology, the ſparus with the tail not forked, and with a black ſpot near it. See the article SPARUS.

ORPIMENT, *auripigmentum*, in natural hiſtory, a foſſile ſubſtance uſually found in copper-mines, compoſed of thin flakes, like the talcs; which eaſily ſplit, and are flexible, and not elaſtic, ſoluble in oil, fuſible in a moderate fire, and yielding in burning an offenſive ſmell like garlic.

Of this genus of foſſils, there are only three known ſpecies: 1. A broad-flaked, gold-coloured kind, well known among the antients, as is plain from the deſcription of it left us by Dioſcorides, and much eſteemed at preſent by our painters. This is found in ſeveral places, as in the iſlands of the Archipelago, in the mines of Goſſelaer, in Saxony, in ſome parts of Turky, and in the Eaſt-Indies, and in its utmoſt purity about Smyrna; this makes the fineſt of all yellows in painting. 2. The ſmall-flaked, yellow kind, which is the common orpiment of the ſhops, and is a fine colour, though greatly inferior to the former. This is found in many parts of the turkiſh dominions, and in Germany. And, 3. Red-orpiment. This has been a name given by the more judicious to ſandarach, and, by the vulgar, to red arſenic, but is to be reſtrained only to this foſſile, which is of a fine bright red, and of the regular texture of the orpiments, and anſwering all their characters. This is a very beautiful ſubſtance of a fine bright red, very gloſſy, and a little tranſparent, and is found in the turkiſh dominions, in the iſlands of the Archipelago, and even in Cornwall, where it is known under the name of red mundic.

The engliſh druggiſts are guilty of an unpardonable piece of ignorance, in that, in general, they know no difference between yellow orpiment, and the yellow fictitious arſenic, which they regularly ſell under its name. The orpiment is known to be a ſafe internal medicine, and the thing they ſell under its name is a very terrible poiſon. The colour-men, however, who ſell both, are well acquainted with the difference.

The errors that have ariſen from the confuſion of names between orpiment and arſenic, have not been, even to this time, thoroughly ſet right; ſome accounting orpiment a poiſon, others an innocent medicine. It is certain that the ſmell of garlic, which orpiment emits, while burning, and its effects in turning copper white by its vapour, ſavour greatly of its containing arſenic, ſince they are qualities of that mineral; yet we have numerous accounts of its having been given with ſafety. The antients gave it internally, and ordered its fumes, while burning, to be received into the mouth in aſthma's, and diſeaſes of the lungs; and the Chineſe, at this time, gave it a place among their cathartic medicines, after it has been burnt a little.

Among the modern writers on theſe ſubjects, Geoffroy declares it a corroſive and poiſonous mineral, and tells us, that the ſymptoms it brings on are ſpaſms of the head and feet, ſtupors, cold ſweats, palpitations of the heart, ſwooning, thirſt and heat, vomitings and tormina of the bowels, and, finally, death itſelf; he adds, that in bodies opened after death, brought on by this poiſon, the throat, ſtomach, and inteſtines have been found inflamed, eroded, and even perforated.

On the other hand, Boerhaave declares orpiment an innocent and harmleſs medicine: and Hoffman, who has been at more pains than any body to examine into its nature, declares the ſame; and even gives inſtances of its being given to dogs without any harm.

It is an excellent depilatory mixed with lime, and made into a paſte with water. The painters are fond of it as a gold-colour; and a lixivium of it, with quick lime, makes ſympathetic ink. See INK.

ORPINE, *anacampſeros*, or *telephium*, in

botany, is a ſpecies of ſedum, with terminatory cluſters of flowers. See the article SEDUM.

The leaves of orpine are accounted vulnerary and aſtringent; being chiefly uſed for eroſions of the inteſtines in the dyſentery.

Baſtard-ORPINE, *telephiaſtrum*, is alſo called by Linnæus anacampſeros: it is a genus of the polyandria-monogynia claſs of plants, the flower of which conſiſts of five roundiſh, concave, and patent petals: the fruit is a triangular and unilocular capſule, conſiſting of three valves, and containing a great many roundiſh ſeeds.

ORRERY, a curious machine, or movement, for repreſenting the motions and appearances of the heavenly bodies. See plate CXCI. fig. 1.

The orrery, or planetarium, is fixed in a frame of ebony, contained by twelve vertical planes, on which are repreſented the twelve ſigns of the zodiac. The upper ſurface is flat, of poliſhed braſs, on whoſe outward circumference are ſcrewed in twelve braſs pillars, which ſupport a large flat ſilvered ring marked 12, repreſenting the ecliptic, with ſeveral circles drawn upon it. The three innermoſt are divided into twelve parts for the ſigns of the zodiac, each of which is divided into thirty degrees, and among theſe degrees are graved in their proper places, the nodes, aphelia, and greateſt north and ſouth latitudes of the planets. Between the next two circles are the cardinal points. The next three circles have the months and the days of the month, according to the new ſtile. Upon the braſs-ſurface of the machine are graduated ſilver-circles, which carry the planets (repreſented by ſilver-balls) upon arbors or ſtems, that raiſe them up to the height of the plane of the ecliptic; and turning about the handle or winch of the orrery, all the planets move at their proportional diſtances from a little gilt ball in the middle, which repreſents the ſun; and perform their revolutions according to their periodical times. There are fixed indices of blued ſteel, which ſhew the longitudes of the planets, by pointing to the diviſions of the ſilvered rings or circles, as they move round. But as theſe circles, being concentric, give only the mean diſtances, the true orbits, according to their excentricities, are graved on the outſide of each circle, with the periodical times taken from the tables, to ſhew what the revolutions are, nearer than can be performed by any machine. The nodes and aphelia, with the places of greateſt north and ſouth latitudes, are alſo marked on thoſe orbits. In the middle of this large circle, deſigned to repreſent the ecliptic, is fixed a globe, 1, to repreſent the ſun. Next the ſun is a ſmall ball, 2, to repreſent mercury. Next to this is venus, 3, repreſented by a larger ball. And, at a greater diſtance from the ſun, you ſee the earth, 4, repreſented by an ivory-ball, ſurrounded, at ſome diſtance, by a ring, which expreſſes the orbit of the moon, making an angle with the circle that repreſents the ecliptic, and thereby ſhewing the inclination they have to each other in the heavens, and alſo the line of the nodes. Within the ſame ring is another ivory-ball, 5, with a black cap or caſe, to repreſent the moon; the cap is contrived always to cover that hemiſphere, which is turned from the ſun, and thereby diſtinguiſh the enlightened part from the dark ſide, and conſequently, her age. 6 repreſents mars. 7 is jupiter attended with his ſatellites, or four moons. And 8, the outmoſt of all the planets, is ſaturn with his ring or belt, and five ſatellites or moons. All theſe are fixed upon ſmall ſtems, which ſeverally repreſent their axes, each of which hath its peculiar and proper inclination to the plane of that circle which repreſents the ecliptic. 9 is a dial-plate; 10, 10, 10, meridians; 11, the equator; 12, the ecliptic with its circles, already deſcribed; 13, 13, two keys for locking and unlocking the diurnal and annual motions; and as to the arctic circle, tropic of cancer, and moveable horizon, they are named in the figure.

By means of the orrery, a great many perſons, who have not time to apply themſelves to the ſtudy of aſtronomy, and yet are deſirous to be acquainted with the celeſtial appearances, in a few days may get a competent knowledge of ſeveral phænomena, and eſpecially, be cured of the common prejudices againſt the motion of the earth, and the copernican ſyſtem. See COPERNICAN.

But the principal uſe of the orrery is to render the theory of the earth and the moon eaſy and intelligible; and to evidence to our ſenſes how all theſe appearances happen, which depend on the annual or diurnal rotation of the earth, and the monthly revolutions of the moon;

as the variety of ſeaſons, the viciſſitudes and various lengths of days and nights, the manner of ſolar and lunar eclipſes, the various phaſes of the moon, &c. There have been various forms invented for this noble inſtrument, two of which have principally obtained, *viz.* the hemiſpherical orrery, and the whole ſphere: though the orrery at firſt was made without any ſphere, with only the ſun, the earth, and moon revolving about it; but as this was too imperfect a ſtate, they ſoon began to inveſt it, ſome with a half ſphere, and others with a whole ſphere, to be an adequate repreſentation of the ſolar ſyſtem.

The hemiſpherical orrery, as that above deſcribed, has been made in greater numbers than any other, on account of their being made much cheaper and eaſier than thoſe in a ſphere of the ſame ſize; there being a vaſt difference between placing an hemiſphere on the box of an orrery, and diſpoſing an orrery in a large moveable ſphere. But the idea given us by the former, is very imperfect and unnatural in compariſon of the latter, and it is ſurpriſing to think how they ſhould have had ſo great a run. An orrery, therefore, adapted to an armillary ſphere, is the only machine that can exhibit a juſt idea of the true ſyſtem of the world, with the diurnal and annual motions of the heavenly bodies. It is likewiſe capable of exhibiting the third motion of the earth, *viz.* that motion of the earth by which the poles of the world revolve about the poles of the ecliptic, and occaſions what is commonly called the preceſſion of the equinoxes, or more properly the retrogreſſion of the earth's nodes.

As the diſtances are in their true proportions to each other, ſo likewiſe are the bodies of the planets in their juſt proportions to one another. But it cannot be expected, that the diameters of the planets ſhould be in proportion to the diameters of the orbits; becauſe taking jupiter under three inches diameter, and the earth a little more than a quarter of an inch, it would require the ſyſtem to be of the bigneſs of a mile and ½, the orbit of ſaturn 9000 feet in diameter, and ſo on of the reſt; which would make the machine 3000 times bigger than it is. And if the bodies were ſuited to the dimenſions given, the bodies muſt be 3000 times leſs, which would render them all inviſible, but the ſun; and that would be leſs than $\frac{1}{100}$th part of an inch. For this reaſon, as a ball big enough to repreſent the ſun cannot be put on, we are to ſuppoſe the ſun (in reſpect of them) as big as the inner circle of the ſilver-ring, which repreſents the ecliptic.

As the orbit of the moon, and the orbits of the ſatellites of jupiter and ſaturn, are quite loſt in this proportion of the orbits of the primary planets, much more are the ſatellites themſelves; therefore the ſatellites are uſually not put on in this poſition of the machine. But ſaturn's ring is joined to ſaturn's body, according to its proportion, and the inclination of its plane to the plane of ſaturn's orbit; and as the planet is carried round, the ring always moves parallel to itſelf, as it does in the heavens. Thereby we ſee why the inhabitants of the earth, in one revolution of ſaturn, ſee the ring twice in the moſt open ſituation of the anſæ, as at ♄, and twice, as if it had no ring, that is, when the edge of the ring is towards the earth (the plane of the ring going thro' the obſerver's eye) and the ſucceſſive increaſing and decreaſing of the viſible bigneſs of the anſæ.

Jupiter, with his moons, is repreſented at ♃, and the ſpots whereby his revolution has been obſerved.

When you have a complete idea of the proportional bigneſs of the planets, jupiter and ſaturn are taken off, and others put on three times leſs than the former, in order to put ſatellites about them (and at the ſame time the moon is joined to the earth) and ſhew how the ſatellites accompany their primary planet in its courſe round the ſun. Theſe ſatellites, which are pearls upon crooked ſtems, do not turn by clock-work round their primaries (as has been done in ſome large orreries) but are only ſet by the hand; becauſe, to do it, would be only a needleſs expence, to give a falſe notion of their bigneſs, diſtances, and inclination of their orbits, in reſpect of their primaries. But to give a right notion of jupiter and his ſatellites, and of ſaturn and his ſatellites, there is ſhewn for each of theſe planets a ſyſtem a-part, where the diſtances from the primary, and the bigneſs of the ſatellites, are expreſſed: and in this ſyſtem, though jupiter is but of about an inch diameter, the outermoſt ſatellite is as far diſtant from jupiter's center, as ſaturn is from the ſun in the machine; which ſhews the inconſiſtency

and

and diſproportion of making the ſatellites to move round jupiter in an orrery. Saturn's ſatellites are ſtill more improperly put in; becauſe four of them move in orbits very much inclined to ſaturn's ecliptic (*viz.* in an angle of above thirty degrees) and the fifth hath its orbit almoſt in the ſame plane as ſaturn's ecliptic, with a diameter greater than the diameter of the whole orrery, even when ſaturn is three times leſs than the ſaturn of the orrery.

The next thing which is put on, is a contrivance to ſhew, that all the confuſion of the planets-motions in the ptolemaic hypotheſis (called their ſtations and retrogradations) is not really, but apparently ſo, in the copernican or true ſyſtem of the world. And this is done by two ſteel-indices, one of which being always applied to the ſun, and ſucceſſively to the top of the ſtem of the planet to be examined, whilſt the other is applied to the earth (as a center) and the ſaid planet: by turning the handle of the machine, the heliocentric and geocentric places of the planet are ſeen on the ecliptic at the ſame time; ſhewing why the planets ſeem to go backwards and forwards when viewed from the earth; tho' they go all the while regularly from weſt to eaſt, as they would be ſeen from the ſun.

When the machine is put in motion, all theſe bodies move round that which repreſents the ſun, and, at the ſame time, both that, and all thoſe which repreſent ſuch of the planets as have been obſerved to have a rotation about their axis, turn round upon the ſaid ſtems, and in their proper times. The ſatellites, or moons, alſo revolve about their primaries at the ſame time; and the ring that repreſents the orbit of the moon has likewiſe its proper motion, whereby that of its nodes is alſo expreſſed. The whole machine is put into motion by turning a ſmall winch, 14, like the key of a clock, with very little ſtrength. And, above this winch, is a cylindrical pin, which may be drawn a little out, or puſhed in at pleaſure: when it is puſhed in, all the planets, both primary and ſecondary, will move according to their reſpective periods, by turning the handle or winch: when it is drawn out, the motions of the ſatellites of jupiter and ſaturn will be ſtopped, while all the reſt move freely. In the place of the ſun, you may fix a braſs-lamp, with two convex-glaſſes, made on purpoſe; which, being placed with the glaſs directly to the earth, and turning round in the ſame time with the earth, throws a continual ſtrong light upon it and the moon, in whatever part of its orbit it is; and ſo not only the times in which the eclipſes of the ſun and moon will happen, are ſhewn, but the phænomena themſelves are truly repreſented.

When you propoſe to uſe this machine, place a ſmall black patch, or a bit of wafer, upon the middle of the ſun, right againſt the firſt degree of ♈: you may alſo place patches upon venus, mars, and jupiter, right againſt ſome noted point in the ecliptic; put on the handle, and puſh in the pin which is juſt above it. One turn of this handle anſwers to a revolution of the ball, which repreſents the earth, about its axis; and, conſequently, to 24 hours of time, as may be ſeen by the motion of the hour-index, 9, which is marked, and placed at the foot of the wire, on which the ball of the earth is fixed: again, when the index has moved the ſpace of ten hours, jupiter makes one complete revolution round its axis; and ſo of the reſt.

By theſe means the revolutions of the planets, and their motions round their own axes, will be repreſented to the eye. And it is worth obſervation, that the diurnal motion of the planets was diſcovered, by obſerving the motions of the ſpots upon the ſurface of the ſun, and of the planets in the heavens, after the ſame manner as we here obſerve the motions of their repreſentatives, by that of the marks placed upon them in this machine.

This machine is ſo contrived, that the winch may be turned either way; ſo that, the ſame number of revolutions being made backwards, they will bring all the planets to their former aſpects or ſituations in reſpect to each other.

It would be too great an undertaking here to give an account of the mechaniſm of the larger ſort of orreries, which repreſent the movements of all the heavenly bodies; nor, indeed, can it be done either by diagram or deſcription, to render it intelligible to the moſt diſcerning reader; but, inſtead of that, we ſhall exhibit an idea of the theory and ſtructure of an uſeful, conciſe, and portable planetarium, which any gentleman may have made for a ſmall expence, and will exhibit, very juſtly, the motions of all the primary

mary planets about the ſun, by wheel-work; and thoſe that have ſecondaries, or moons, may have them placed about their primaries moveable by the hand, ſo that the whole ſhall be a juſt repreſentation of the ſolar ſyſtem, or true ſtate of the heavens, for any given time of the year.

In order to this we muſt compare, and find out the proportion, which the periodical times, or revolutions of the primary planets, bear to that of the earth; and they are ſuch as are expreſſed in the table below, where the firſt column is the time of the earth's period in days and decimal parts; the ſecond, that of the planets; the third and fourth are numbers in the ſame proportion to each other: as,

365,25 : 88	☿	:: 83 : 20, for merc.
365,25 : 224,7	♀	:: 52 : 32, for venus.
365,25 : 686,9	♂	:: 40 : 75, for mars.
365,25 : 4332,5	♃	:: 7 : 83, for jupit.
365,25 : 10759,3	♄	:: 5 : 148, for ſat.

If we now ſuppoſe a ſpindle or arbor with ſix wheels fixed upon it in an horizontal poſition, having the number of teeth in each, correſponding to the numbers in the third column, *viz.* the wheel A M (*ibid.* fig. 2.) of 83 teeth, B L of 52, C K of 50 (for the earth), D I of 40, E H of 7, and F G of 5; and another ſet of wheels moving freely about an arbor, having the number of teeth in the fourth column, *viz.* A N of 20, B O of 32, C P of 50 (for the earth), D Q of 75, E R of 83, and F S of 148; then, if thoſe two arbors of fixed and moveable wheels are made of the ſize, and fixed at the diſtance from each other, as here repreſented in the ſcheme, the teeth of the former will take thoſe of the latter, and turn them very freely, when the machine is in motion.

Theſe arbors, with their wheels, are to be placed in a box, of an adequate ſize, in a perpendicular poſition: the arbor of fixed wheels to move in pivots at the top and bottom of the box; and the arbor of moveable wheels to go through the top of the box, to a proper height, on the top of which is to be placed a round ball, gilt with gold, to repreſent the ſun. On each of the moveable wheels is to be fixed a ſocket, or tube, aſcending above the top of the box, and having on the top a wire fixed, and bent at a proper diſtance into a right angle upwards, bearing on the top a ſmall round ball, repreſenting its proper planets.

If then on the lower part of the arbor of fixed wheels be placed a pinion of ſcrew-teeth, a winch turning a ſpindle with an endleſs ſcrew, playing in the teeth of the arbor, will turn it with all its wheels; and theſe wheels will move the others about with their planets, in their proper and reſpective periods of time, very exactly. For, while the fixed wheel C K moves its equal C P once round, the wheel A M will move A N a little more than four times round, and ſo will nicely exhibit the motion of mercury; and the wheel F G will turn the wheel F S about $\frac{1}{29,5}$ round, and ſo will truly repreſent the motion of ſaturn: and the ſame is to be obſerved of all the reſt.

ORRICE, the common name of the iris-root. See the article IRIS.

ORSA, a town of Lithuania, ſituated in 30° 40′ eaſt long. and 55° 30′ north lat.

ORSOWA, a town of the bannat of Temeſwaer, ſituated on the north ſide of the Danube, almoſt oppoſite to Belgrade.

ORSOY, a town of Weſtphalia, twenty miles ſouth of Cleves.

ORTA, a town of St. Peter's Patrimony, thirty-five miles north of Rome.

ORTEGAL *caſtle and cape*, the moſt northerly promontory of Spain, thirty miles north-eaſt of Ferrol: weſt long. 8° 22′, north lat. 44°.

ORTEGIA, in botany, a genus of the triandria-monogynia claſs of plants, the calyx of which conſiſts of five erect leaves; there is no corolla; the fruit is a roundiſh capſule, containing but one cell, in which are a great many very ſmall, oblong ſeeds, acute on both ſides.

ORTEIL, in fortification, the ſame with berme. See the article BERME.

ORTHODOX, in church-hiſtory, an appellation given to thoſe who are ſound in all the articles of the chriſtian faith.

ORTHOGONIAL, in geometry, the ſame with rectangled. See RECTANGLED.

ORTHOGRAPHIC *projection of the ſphere*, that wherein the eye is ſuppoſed at an infinite diſtance; ſo called becauſe the perpendiculars from any point of the ſphere, will all fall in the common interſection of the ſphere with the plane of the projection. See PROJECTION and MAP.

ORTHOGRAPHY, that part of grammar which teaches the nature and affections of letters, and the juſt method of ſpelling or writing words with all the proper and neceſſary letters, making one of the four greateſt diviſions or branches of

of grammar. See the articles GRAMMAR, LETTER, WORD, &c.

Orthography being, therefore, the doctrine of letters, treats principally of five heads, *viz.* 1. The number and diviſion of letters. 2. Their accidents. 3. The juſt manner of writing letters, which, properly ſpeaking, is orthography. 4. The pronunciation of letters. And, 5. The diſpoſition of letters into ſyllables. See the article PRONUNCIATION, &c.

As to orthography, properly ſo called, or the right ſpelling of words, it muſt be learned from the beſt authors in each language. However, it ought to be obſerved, that orthography has appointed one way of ſpelling a word in common language, and another in the learned and polite diction: thus, in ordinary, we ſay, and write, *fancy*, *fantom*, *frenzy*, &c. for *phantaſy*, *phantom*, *phrenzy*, &c. according to the original etymology of theſe words: and in ſuch caſes, as vulgariſms ought to be carefully avoided, ſo as not to write *obſtropulus* for *obſtreperous*, and the like; ſo, on the other hand, we muſt not alter the received orthography, in imitation of any one man, be his authority or learning ever ſo great; the general uſage being, in this reſpect, the only rule that ought to be followed, ſince innovations rather confound than help the learner.

We ſhall therefore only add one obſervation more, with reſpect to the orthography of words, *viz.* that it ought, as much as poſſible, to be agreeable to the original etymology, ſenſe, and pronunciation of words: thus it is better to write *phrenzy* than *frenzy*, on account of its being derived from the greek φρην; in the ſame manner, the participle of the verb *finge* ſhould be written *fingeing*, on account of the ſenſe, to diſtinguiſh it from *finging*; and, laſtly, when letters are neither neceſſary on account of the etymology, ſenſe, or ſound, they ought to be rejected, as *public* for *publick*, the *k* being wholly ſuperfluous.

As for that part of orthography which regards ſpelling, ſee SPELLING.

ORTHOGRAPHY, in geometry, the art of drawing or delineating the fore-right plan of any object, and of expreſſing the heights or elevations of each part. It is called orthography, from its determining things by perpendicular lines falling on the geometrical plane.

ORTHOGRAPHY, in architecture, the elevation of a building.

This orthography is either external or internal. The external orthography is taken for the delineation of an external face or front of a building; or, as it is by others defined, the model, platform, and delineation of the front of a houſe, that is contrived, and to be built, by the rules of geometry, according to which pattern the whole fabric is erected and finiſhed. This delineation or platform exhibits the principal wall with its apertures, roof, ornaments, and every thing viſible to an eye placed before the building. Internal orthography, which is alſo called a ſection, is a delineation or draught of a building, ſuch as it would appear were the external wall removed.

To lay down the orthography of a building, draw a right line, for a baſe or grounding A B (pl. CLXXXIX. fig. 3.) and at one end erect a perpendicular AD; ſet off the width and diſtances of the gates, or doors, windows, &c. Upon A B and on the right line A D, ſet off the heights of the ſeveral parts viſible in the face of the building, *v. g.* of the doors, windows, the roof, chimnies, &c. and apply a ruler to each point of diviſion. The common interſections of the right lines drawn from the points parallel to the lines A B and A D, determine the external orthography of the building; and, after the ſame manner, is the internal orthography to be laid down.

ORTHOGRAPHY, in perſpective, is the fore-right ſide of any plane, *i. e.* the ſide or plane that lies parallel to a ſtraight line, that may be imagined to paſs through the outward convex points of the eyes, continued to a convenient length.

Lamy and others uſe the word ſcenography in the ſame ſenſe.

ORTHOGRAPHY, in fortification, is the profile or repreſentation of a work; or a draught ſo conducted, as that the length, breadth, height, and thickneſs of the ſeveral parts are expreſſed, ſuch as they would appear if perpendicularly cut from top to bottom. See FORTIFICATION.

ORTHOPNOEA, in medicine, a ſpecies or degree of aſthma, where there is ſuch a difficulty of reſpiration, that the patient is obliged to ſit or ſtand upright, to be able to breathe. See ASTHMA.

ORTIVE, in aſtronomy, the ſame with eaſtern: the ortive or eaſtern amplitude, is an arch of the horizon intercepted between where a ſtar riſes, and the eaſt point of the horizon, or point where the horizon and equator interſect.

ORTON,

ORTON, a market-town of Weſtmoreland, ſituated ten miles ſouth-weſt of Appleby.

ORTYGOMETRA, DAKER HEN, in ornithology, a genus of birds, of the order of the ſcolopaces, the beak of which is ſhorter than the toes: it is of a compreſſed figure, and terminates in a kind of point; both the chaps are equal in length. There is but one ſpecies of this genus: it is of the ſize of our common magpye, and is a ſingular and elegant bird; the head is ſmall and oblong; the eyes are large, and their iris reddiſh, the pupil is black; the head, neck, back, and tail are of a bright and elegant brown, variegated in a beautiful manner with ſpots of black; the throat is of a pale, whitiſh grey, as are alſo the breaſt and belly.

ORVALA, in botany, a genus of the didynamia-gymnoſpermia claſs of plants, the corolla of which conſiſts of a ſingle ringent petal; the tube is of the length of the cup; the limb is erect, long, and divided into four ſegments; there is no pericarpium; the ſeeds, being four in number, and kidney-ſhaped, are contained in the bottom of the cup.

ORVIETANUM, in pharmacy, the name of a celebrated antidote, ſo called, according to Lemery, from Orvietto, a city of Italy, where it was firſt uſed; but, according to others, from Hieronymus Ferrantes Orvietanus, a famous mountebank, who invented it.

The method of preparing this medicine may be ſeen in Lemery's Pharmacopée.

ORVIETTO, a city of Italy, in the pope's territories, capital of the province of Orvietto, ſituated at the confluence of the Tiber and the Chiane: eaſt long. 13°, north lat. 43°.

ORWELL, a river of Suffolk, which, riſing in the middle of that county, runs ſouth-eaſt, by Ipſwich, and falls into the German ſea, at Landguard-fort.

ORYZA, RICE, in botany, a genus of the hexandria-digynia claſs of plants, the corolla of which is formed of two obtuſe, large, nearly equal, and permanent valves: the nectarium is compoſed of two leaves, plane, very ſmall, and ſituated on the ſides of the germen; the leaves of it are narrow at the baſe, truncated, and deciduous; there is no pericarpium; the corolla grows to the ſeed, and becomes of an oblong oval figure, compreſſed, thin at the edges, and marked each way with two lines on the ſides; the ſeed is ſingle, large, obtuſe, oblong, and compreſſed.

This plant is cultivated in vaſt abundance in the Eaſt, as alſo in Carolina, for food. It is ſaid to be good in dyſenteries, diarrhœas, &c.

Rice, on importation, pays a duty of 6 s. $4\frac{60}{100}$ d. the hundred weight; and draws back, on exportation, 5 s. 9 d.

OS, in anatomy. See BONE and MOUTH.

For the os calcis, os femoris, os frontis, os occipitis, &c. ſee CALCIS OS, &c.

OS SACRUM. See SACRUM OS.

OSACA, a great city and port-town of Japan, ſituated on the bay of the ſea, on the eaſt ſide of the iſland, in eaſt long. 135°, north lat. 35°.

OSBECKIA, in botany, a genus of the octandria monogynia claſs of plants, the calyx of which is a ſingle leafed, bell-ſhaped, permanent perianthium; the corolla conſiſts of four roundiſh ſeſſile petals, longer than the cup; the fruit is an oval capſule, covered with the truncated tube of the cup, containing four cells, in which are a great many roundiſh ſeeds: the receptacle is moon-ſhaped.

OSCHEOCELE, in ſurgery, a hernia of the ſcrotum. See the article HERNIA.

Of this rupture, ſometimes called hernia ſcrotalis, there are two kinds; a true one, proceeding from a prolapſion of the inteſtine, or omentum; and a ſpurious one, or only apparent, ariſing from a tumour of the teſticles, or ſpermatic veſſels, or a diſtention with air, water, or ſome offending humour: the oſcheocele is therefore diſtinguiſhed into various kinds, according to the different ſubſtances with which the ſcrotum is diſtended, by which it is alſo differently denominated: when the inteſtine is prolapſed through the proceſs of the peritonæum into the ſcrotum, the tumour is then called enterocele; if from the omentum, epiplocele; if from a diſtention with water, hydrocele; if from wind or flatus, pneumatocele; when from blood, hæmatocele; if the teſticle is enlarged beyond its proper dimenſions, it is termed ſarcocele; and when the ſpermatic veins are too much diſtended, it is termed varicocele, cirſocele, or hernia varicoſa; and when an abſceſs is formed in the ſcrotum, it is by ſome termed hernia humoralis; ſometimes two or more of theſe ſubſtances concur together to form the tumour, which is then named conjunctly from them entero-epiplocele, hydro-enterocele, &c. each of theſe may be ſeen ſe-

parately treated of, under their ſeveral heads. See the articles ENTEROCELE, EPIPLOCELE, &c.

OSCHOPHORIA, in antiquity, an athenian feſtival, inſtituted by Theſeus, in acknowledgement for his having deſtroyed the Minotaur, and thereby freed his country from the tribute of ſeven young men, who were to be ſent every year into Crete, to be devoured by that monſter.

At this feſtival there was always a race by young men elected out of every tribe, who run from Bacchus's temple to that of Minerva Sciras: the place where the race ended, was called Oſchophorion, and the victor's reward was a cup containing a mixture of wine, honey, and oil.

OSCILLA, in antiquity, ſmall images of wax or clay, which were made in the ſhape of men and women, and conſecrated to Saturn, in order to render him propitious.

OSCILLATION, in mechanics, the vibration, or reciprocal aſcent and deſcent of a pendulum. See PENDULUM.

It is demonſtrated, that the time of a complete oſcillation in a cycloid, is to the time in which a body would fall thro' the axis of that cycloid, as the circumference of a circle to its diameter; whence it follows, 1. That the oſcillations in the cycloid are all performed in equal times, as being all in the ſame ratio to the time in which a body falls through the diameter of the generating circle. 2. As the middle part of the cycloid may be conceived to coincide with the generating circle, the time in a ſmall arch of that circle will be nearly equal to the time in the cycloid: and hence the reaſon is evident, why the times in very little arches are equal. 3. The time of a complete oſcillation in any little arch of a circle, is to the time in which a body would fall through half the radius; as the circumference of a circle, to its diameter; and ſince the latter time is half the time in which a body would fall through the whole diameter, or any chord; it follows, that the time of an oſcillation in any little arch, is to the time in which a body would fall through its chord, as the ſemi-circle to the diameter. 4. The times of the oſcillations in cycloids, or in ſmall arches of circles, are in a ſubduplicate ratio of the lengths of the pendulums. 5. But if the bodies that oſcillate be acted on by unequal accelerating forces, then the oſcillation will be performed in times that are to one another in the ratio compounded of the direct ſubduplicate ratio of the lengths of the pendulums, and inverſe ſubduplicate ratio of the accelerating forces. Hence it appears, that if oſcillations of unequal pendulums are performed in the ſame time, the accelerating gravities of theſe pendulums muſt be as their lengths; and thus we conclude, that the force of gravity decreaſes, as you go towards the equator, ſince we find that the lengths of pendulums that vibrate ſeconds, are always leſs at a leſs diſtance from the equator. 6. The ſpace deſcribed by a falling body in any given time, may be exactly known: for finding, by experiments, what pendulum oſcillates in that time, the half of the pendulum will be to the ſpace required, in the duplicate ratio of the diameter of a circle to the circumference.

Center of OSCILLATION. See CENTER.

OSCINES, among the Romans, an appellation given to ſuch birds, from whoſe chattering or notes, omens and predictions were drawn; in which ſenſe they ſtood contra-diſtinguiſhed from the alites, or ſuch birds as afforded matters for auguries by their flight. See ALITES.

OSCITATION. See YAWNING.

OSERA, a venetian iſland, in the gulph of Venice: eaſt long. 15° 30′, north lat. 45°.

OSIMO, a town of Italy, in the territories of the pope, and marquiſate of Ancona: fifteen miles north weſt of Loretto.

OSMERUS, in ichthyology, a genus of the malacopterygious claſs of fiſhes, the back and belly fins whereof are placed at the ſame diſtance from the head; the teeth are large and ſtrong, and placed in both jaws, and alſo on the tongue and palate; the branchioſtege-membrane on each ſide has ſeven or eight rays.

This genus comprehends the ſmelt and tarantola-fiſh. See the articles SMELT and TARANTOLA FISH.

OSMUNDA, in botany, a genus of the cryptogamia-filicum claſs of plants, of which no part of the fructification is viſible, except the fruit: this is a globoſe, diſtinct capſule, many of which are arranged together in cluſters, and which, when mature, open horizontally, and are found to contain a great number of very minute ſeeds of an ovated ſhape.

This genus comprehends the oſmund-royal, and the moonwort.

OSNA-

OSNABURG, the capital of the biſhopric of the ſame name, in the circle of Weſtphalia: eaſt long. 7° 40′, north lat. 52° 31′. The territories of this biſhopric, which are forty miles long, and thirty broad, are ſubject to its biſhop: and this biſhopric is alternately held by a proteſtant and papiſt, the proteſtant being always a prince of the houſe of Brunſwic.

OSORNO, a town of Chili, in ſouth America: weſt long. 80°, ſouth lat. 41°.

OSPREY, *oſſifragus*, a bird of the falcon-kind, as big as a large cock, and more generally known by the names of haliætus, and bald-buzzard. See the articles HALIÆTUS and FALCO.

OSSICLE, *officulum*, a little bone, a diminutive of bone, in which ſenſe it is frequently uſed by anatomiſts.

Botaniſts alſo uſe officulum for the ſtone of a plumb, cherry, or any other ſtone-fruit.

OSSIFICATION, the formation of bones, but more particularly the converſion of parts naturally ſoft, to the hardneſs and conſiſtence of bones.

Dr. Niſbet's opinion of oſſification is, that in the blood, or a fluid ſecreted from it, there is an oſſifying juice conſiſting of particles that are not apparent: that whenever nature deſigns an oſſification between membranes, or within a cartilage, ſhe occaſions a more than uſual afflux of this fluid, which ſo diſtends the veſſels that were before inviſible, as to make them capable of receiving the red globules of blood, which are always to be ſeen near the place where oſſification is begun. In this blood, gritty bony particles are to be felt by the point of a knife, which have been formed by the attraction and coheſion of the particles of the oſſifying juice obſtructed, along with the other groſſer fluids in the beginning of the veſſels prepared to receive the refluent juices. The blood being capable of forming fine membranes, the membranaceous parts of a bone, which act as a gluten to keep theſe particles and fibres together, if there be any ſuch, that do not ariſe from the coats of its veſſels, are produced by a coheſion round the cretaceous particles of a part of the fluid, in which they were generated and contained. Thus the membranes of cartilages ſerve as a bed between, or within which the bony particles are depoſited, or ſhoot; but without any intermixture of the particles of the bone and cartilage, or continuation of the fibres of the one ſubſtance to thoſe of the other, as is evident in cartilages containing bones kept long enough in water, and then ſlit; for the bone will, as ſoon as the large veſſels that enter its ſubſtance are divided, ſlip as eaſily from it as an acorn does out of its cup: and there is a ſmoothneſs and poliſh of the parts of both cartilage and bone, which ſhew there is no conjunction of the fibres of the two ſubſtances. While the bones are increaſing within cartilages, the cartilages are extended and ſpread out; by which, with the preſſure which they ſuffer, and the great influx of various fluids, and the nutritious matter being hindered from flowing freely into them, they decreaſe continually; and, at laſt, may truly be ſaid to be entirely deſtroyed.

For the formation of the bones of a foetus, ſee the article FOETUS.

OSSORY, the weſt diviſion of Queen's County in Ireland.

OSSUNO, a town of Spain, in the province of Andaluſia, forty miles eaſt of Seville.

OSTAGIO, a town of Italy, in the territory of Genoa, fifteen miles north-weſt of Genoa.

OSTATRIC, a town of Spain, in the province of Catalonia, twenty-four miles north-eaſt of Barcelona.

OSTEND, a city and port-town of the Auſtrian Netherlands, in the province of Flanders, ſituated twelve miles weſt of Bruges: eaſt long. 2°. 45′, north lat. 51° 15′.

OSTEOCOLLA, in natural hiſtory, tho' ſuppoſed by many to be an earth, is truly a cruſtated kind of ſpar, debaſed by earth, and therefore not tranſparent. See the article SPAR.

It is uſually found coating over vegetable, or other bodies, in form of incruſtations; ſo that the true oſteocolla is a tubular cruſtaceous ſpar, of a very foul and coarſe texture, and carries with it much more of the appearance of a marl, than of a ſpecies of ſpar.

The maſſes of oſteocolla, though regularly of the ſame figure, are very different in ſize; ſome of them being not thicker than a crow-quill, and others of five and ſix inches diameter: it is always, however, of a tubular figure, and wrinkled and rough ſurface.

Oſteocolla is frequent in Germany, where it is found buried near the ſurface of the earth, ſometimes in ſtrata of ſand, but more frequently among marls: it ſhould

be choſen for uſe, the pureſt that can be had of a pale brown colour, and of a tolerably cloſe and firm texture.

It has long been famous for bringing on a callus in fractured bones; its name oſteocolla ſignifying the bone-glue, or bone-binder. It is alſo recommended as a diuretic, and as good in the fluor albus; but, at preſent, little regard is paid to it; ſince, if it has any virtues, they muſt be wholly owing to ſpar, which may be given to greater advantage in a purer form.

OSTEOCOPOS, in medicine, any pain in the bones, whether ariſing from wearineſs, a ſharp ſcorbutic humour, or a venereal taint. See PAIN.

OSTEOLOGY, that branch of anatomy which treats of the bones. See BONE.

The objects of oſteology are the bones, whether they be recent or dried, whether they have belonged to an infant or an adult; and with the bones are to be conſidered their perioſteum, medulla or marrow, the ligaments, and the cartilages. See the articles OSSIFICATION, MEDULLA, &c.

The ſtudy of the bones is to be conſidered in two lights; as theoretical, or as practical. In the firſt ſenſe, oſteology only extends to the external conformation and uſe of the bones: whereas in the latter or practical ſenſe, it comprehends the more intimate knowledge of their interior ſtructure and connections. 1. If their internal parts are the ſubjects of enquiry, they are to be cut or broken. 2. If the articulations are to be examined, the ligaments and cartilages, as well as the articulations themſelves, muſt be diſſected and carefully obſerved. 3. If the making a ſkeleton be the intent, then their preparation and preſervation come into this branch. See the articles BONE, ARTICULATION, LIGAMENT, SKELETON, &c.

OSTEOSPERMUM, in botany, a genus of the ſyngeneſia-polygamia-neceſſaria claſs of plants, the compound flower of which is radiated; the hermaphrodite corollulæ are numerous in the diſc; the female ones are about ten in the radius; there is no other pericarpium but the cup; the hermaphrodite ſeeds are abortive; the female ones are ſolitary, globoſe, coloured, and at length indurated, including a nucleus; the receptacle is naked and plane.

OSTIA, a port-town of Italy, in the pope's territores, ſituated at the mouth of the Tiber: eaſt long. 13°, north lat. 41° 30′.

OSTIA, in anatomy, an appellation given to the orifices or apertures of the veſſels of the body.

OSTIGLIA, a town of the dutchy of Mantua, fifteen miles eaſt of Mantua.

OSTRACION, in ichthyology, a genus of the branchioſtegious order of fiſhes, of a globoſe, oval, or ovato-quadrangular figure: the ſkin is always very firm and hard; and is in ſome ſpecies ſmooth, in others entirely covered with ſpines; and, finally, in ſome the ſpines entirely occupy only particular places: there are no belly-fins, and the others are five in number, *viz.* two pectoral or lateral fins, one on the back, the pinna ani, and the tail. To this genus belong the globe-fiſh, the horned triangular-fiſh, the porcupine-fiſh, ſun-fiſh, &c.

OSTRACISM, ὀστρακισμὸς in grecian antiquity, denotes the baniſhment of ſuch perſons whoſe merit and influence gave umbrage to the people of Athens, leſt they ſhould attempt any thing againſt the public liberty. It was ſo called, becauſe the people voted a perſon's baniſhment, by writing his name on ſhells, called in greek ὄστρακον, and caſting them into an urn.

OSTRACITES, in natural hiſtory, the name by which authors call the foſſile oyſter-ſhells. See the article OYSTER.

Oſtracites has the ſame medicinal virtues with the belemnites, and lapis judaicus, only in a higher degree; being accounted, by Dr. Liſter, one of the greateſt known medicines in nephritic caſes: the doſe, in powder, is from half a dram to a dram, in white wine; and to prevent a ſickneſs at the ſtomach, that ſometimes attends the taking it, one third part of the quantity of powdered chamamile-flowers may be mixed with it.

OSTRACITES is alſo a kind of cadmia. See the article CADMIA.

OSTRACODERMATA, in natural hiſtory, an appellation given to the teſtaceous ſhells; eſpecially of the echini marini.

OSTREA, the OYSTER. See the article OYSTER.

OSTRICH, *ſtruthio*, in ornithology, a diſtinct genus of birds, of the order of the gallinæ: it has only two toes to each foot; and theſe are both placed forward; and its head is ſimple, or not ornamented with the appendages which are common to moſt birds of this order.

The

The oſtrich is the talleſt of all the bird kind, meaſuring ſeven or eight feet when it ſtands erect: its legs are very long and naked; and the ſtructure of the foot, having only two toes, is particular.

OSTROGOTSKOI, a city of Ruſſia, in the province of Belgorod: eaſt long. 40° 30′, north lat. 51° 25′.

OSTUNI, a biſhop's ſee of the kingdom of Naples, eighteen miles north of Taranto.

OSWEGO, a town of the Iroquois, in North America, three hundred miles weſt of Albany, in New-York.

OSWESTRY, a market town in Shropſhire, fifteen miles north-weſt of Shrewſbury.

OSYRIS, POET'S ROSEMARY, in botany, a genus of the dioecia-triandria claſs of plants, without any flower-petals: the fruit is a globoſe unilocular berry, containing a ſingle oſſeous ſeed.

This whole ſhrub is aſtringent, and conſequently good in fluxes.

Oſyris is alſo a name ſometimes uſed for the linaria, or toad-flax.

OTALGIA, the EAR-ACH. See EAR.

OTHONNA, BASTARD-JACOBÆA, in botany, a genus of the ſyngeneſia-polygamia-neceſſaria claſs of plants, the compound flower of which is radiated, with a great number of tubuloſe and quinquedentated hermaphrodite ones on the diſc: the ſtamina are five very ſhort capillary filaments; and the ſeed, which is ſingle after each flower, is contained in the cup, and is either naked or crowned with down.

OTIS, the BUSTARD, in ornithology, makes a diſtinct genus of birds, of the order of the gallinæ, the characters of which are theſe: there are three toes on each foot, all turned forwards; and the head is naked, or has no comb.

The buſtard has been confounded with the turkey: it is about the ſize of the common peacock, and runs at a prodigious rate, being frequently taken with greyhounds in a fair courſe, in the manner of hunting the hare: its fleſh is well taſted.

OTLEY, a market-town, twenty-one miles weſt of York.

OTOQUE, an iſland ſituated in the bay of Panama, from whence this city is furniſhed with proviſions: weſt long. 82°, north lat. 7°.

OTRANTO, a city and archbiſhop's ſee of the kingdom of Naples, ſituated at the entrance of the gulph of Venice: eaſt long. 19° 15′, north lat. 40° 12′.

OTRICOLI, a town of Italy, thirty-five miles north of Rome.

OTTER, *lutra*, in zoology, a genus of quadrupeds, of the order of the feræ, the characters of which are theſe: the fore-teeth in the upper-jaw are ſtraight, diſtinct and acute; thoſe of the under jaw are obtuſe, and ſtand cloſe together: the ears are ſituated lower than the eyes, and the feet are furniſhed each with five toes, and are palmated or formed for ſwimming.

Of this genus there are two ſpecies: 1. The common otter, with all the toes of an equal length: this is a very fierce animal, three feet in length, including the tail. 2. The braſilian otter, with the inner toe ſhorter than the reſt. This is ſomewhat larger than the former ſpecies.

OTTER-HUNTING. See HUNTING.

OTTER-PIKE, in ichthyology, a ſpecies of trachinus, with the under jaw longeſt, and without any cirri, being otherwiſe called weaver. See TRACHINUS.

OTTOMAN, or OTHOMAN, an appellation given to the turkiſh empire, from Othomannus, or Oſmanhus, the firſt emperor of the preſent family.

OTTONA, or ORTONA, a city of the kingdom of Naples, ſituated on the gulph of Venice, in eaſt long. 15° 30′, north lat. 42° 22′.

OTUS, in ornithology, a name whereby ſome writers call the leſſer horn-owl. See the articles STRIX and OWL.

OVA, EGGS, in phyſiology, architecture, *&c.* See the article EGG.

For the ova of women, ſee EGG, FALLOPIAN, GENERATION, and OVARIES.

OVAL, an oblong curvilinear figure, otherwiſe called ellipſis. See ELLIPSIS. However, the proper oval, or egg-ſhape, differs conſiderably from that of the ellipſis, being an irregular figure, narrower at one end than at the other; whereas the ellipſis, or mathematical oval, is equally broad at each end: though, it muſt be owned, theſe two are commonly confounded together; even geometricians calling the oval a falſe ellipſis.

For oval columns and crowns, ſee the articles COLUMN and CROWN.

OVALE FORAMEN. See the articles FORAMEN and FOETUS.

OVARIES, in anatomy, called, by the earlier writers, teſtes muliebres, are two bodies of nearly an oval figure; but gibbous on the upper ſurface, and flat below;

low: they are of a whitiſh colour and ſmooth ſurface, and are annexed, one on each ſide, to the fundus of the womb. They are connected, 1. To the fundus uteri, by means of the ligamentum teres; 2. To the fallopian tubes, and the ſides of the pelvis, by the ligamenta lata of the uterus, and the alæ veſpertilionum; and 3. To many other parts by means of the ſpermatic veſſels.

Their ſize differs, according to the age and temperament of the ſubject. They are largeſt in perſons in the vigour of their age, and in ſuch as are addicted to luſt; in ſuch ſubjects, they are found of two drams weight, and furniſhed with a number of prominent veſicles. In old people, they ſcarce weigh ſo much as half a dram, and are dry, corrugated, and deformed with cicatrices.

The ovaries are ſurrounded by a ſtrong white membrane from the peritonæum, and are of a membranaceous ſubſtance, fibrous, reticulated, and full of veſſels variouſly interwoven; among which are a number of round veſicles, with a yellow ſubſtance diſpoſed under them: theſe are more or fewer in number, according to the age and temperament of the perſon; and are filled with a ſubſtance much reſembling the white of an egg, which acquires alſo, on boiling, the hardneſs and conſiſtence of a boiled egg. From this analogy with the eggs of birds, theſe veſicles were called, by Hornius, ova or ovula: the largeſt of them are hardly ſo big as a pea; but there are ſometimes ten, ſometimes fifteen, and at other times twenty, or more, in one ovary; though ſometimes there are only one or two of them: theſe are ſuppoſed to contain the firſt rudiments of the fœtus. See the article FOETUS.

OVATION, in the roman antiquity, a leſſer triumph, allowed to commanders for victories won without the effuſion of much blood; or for defeating a mean and inconſiderable enemy. The ſhow generally began at the Albanian mountain, whence the general with his retinue, made his entry into the city on foot, with many flutes or pipes ſounding in concert as he paſſed along, and wearing a garland of myrtle as a token of peace. The term ovation, according to Servius, is derived from *ovis*, ſheep, becauſe on this occaſion the conqueror ſacrificed a ſheep, as in triumph he ſacrificed a bull.

OUDENARDE, a town of the Auſtrian Netherlands, in the province of Flanders, ſituated on the river Scheld, thirteen miles ſouth of Ghent.

OUDENBURG, a town of the Auſtrian Netherlands, in the province of Flanders, five miles ſouth-eaſt of Oſtend.

OVEN, a kind of domeſtic furnace, uſed for baking bread, pies, tarts, &c. of a circular ſtructure, with a very low roof, well lined, both on the top, bottom, and ſides, with ſtone; it has a ſmall entrance in the front, which is exactly fitted by a kind of door, which being clapped to the mouth of the oven confines the heat, while bread, pies or puddings are baking. Over this, paſtery-cooks, &c. have another oven built much in the ſame manner, which is uſed for ſuch things as require a leſs degree of heat. Ovens are heated by burning dry wood, faggots, &c. in them, till all the parts are equally hot.

Aſſaying-OVEN, in metallurgy, a particular kind of furnace, uſed by aſſayers in their operations upon metals.

The aſſaying-oven is conſtructed in the following manner: make with iron-plates a hollow quadrangular priſm, eleven inches broad and nine inches high, (as in plate CLXXXIX. fig. 4.) ending at top in a hollow quadrangular pyramid, *bb cc*, of ſeven inches in height, terminating in an aperture at top ſeven inches ſquare. At the bottom it muſt be cloſed with another iron-plate, which ſerves as a bottom to it: near the bottom make a door, *e*, three inches high and five broad, to lead to the aſh-hole: above this door, and at the height of ſix inches from the baſis, make another door *f*, of the figure of the ſegment of a circle: then faſten three long iron-plates on the fore-part of the furnace with rivets, one with its lower edge, as at *g g*, half an inch high; the ſecond three inches high, as at *b b*; and the third, which is like the firſt, above the upper door at *i i*; and theſe plates are to be ſet on in ſuch a manner as to form grooves: in order to ſhut both doors, you muſt adapt to each of them two ſliders, *k k*, *l l*, made of iron-plates, to move within the abovementioned grooves, each of which ſhould have a handle, but the two ſliders belonging to the upper door, muſt have each a hole near the top; that is, one a ſmall hole, a fifth of an inch broad, and an inch and a half long, as at *m*; and the other a ſemicircular aperture, one inch high and two inches broad,

broad, as at *n*: beſides theſe, let five round holes, each of an inch in diameter, be bored in the furnace, two of which muſt be in the fore-part, as at *oo*; two in the back-part, oppoſite to the former, and all of them two inches and a half diſtant from each of the ſides; and a fifth hole, *p*, muſt be made at the height of one inch above the upper edge of the upper door. The inſide of the furnace muſt be lined throughout with iron hooks, ſtanding out above half an inch, and placed at about three inches diſtance from each other, to hold on the matter of the lute, with which the whole inner ſurface is to be coated: let an iron, moveable, hollow, quadrangular pyramid, *q*, of three inches in height, be next adapted to the upper aperture of the furnace, ſo as to ſlide into the grooves *cc*; it muſt have two handles, as at *ss*, and be ſeven inches broad at the baſis, and end upwards in a hollow tube, *r*, three inches in diameter, two inches high, and nearly cylindrical, but a little convergent at the top: this tube ſerves to ſupport an iron-funnel or flue, *t*, which muſt be nearly cylindrical, hollow, and two feet long: this, when a very ſtrong fire is required, muſt be put perpendicularly on the ſhorter tube, in ſuch a manner that the latter enters about an inch and a half cloſely and evenly into it, and may be taken off at pleaſure when the fire is not required to be ſo very violent: let a ſquare ledge, made of a thick iron-plate, be faſtened at the top of the upper edge of the lower door, which will conveniently ſupport the grate and the lute; but this ledge muſt be made of two pieces, that it may be eaſily introduced into the cavity of the furnace. You muſt next place within the furnace ſmall quadrangular iron-bars, half an inch thick, and faſten them edgeways on the extremities of the ledge, three quarters of an inch diſtant from each other. The inſide of the furnace being then luted with windſor-loam, and dried by a gentle heat, will be fit for uſe.

The beſt fuel for this furnace is charcoal made of hard wood, and broken into pieces about an inch big, which muſt be introduced through the top of the furnace; and when an operation is performed, two iron-bars are to be put through the four holes above-mentioned, on which the muffle being introduced through the upper aperture, is placed in ſuch a manner, as that the open foreſide of it be contiguous to the inward border of the upper door.

OVER, in general, ſignifies one thing being above another; through, or from, one end to another; beyond, croſs, or overthwart: it alſo denotes exceſs, &c. thus,

OVER-BLOW, among ſeamen, is when the winds blow ſo very hard, that the ſhip can bear no topſails.

OVER-DONE, in the manege: a horſe is ſaid to be over-done when his wind and ſtrength are broke and exhauſted with fatigue.

OVER-FLOWING *of lands*, among huſbandmen, is commonly effected by diverting the ſtreams of rivers, brooks, land-floods, or ſprings, or ſome part of them, out of their natural channel: but where ſtreams lie too low for this, they are made uſe of to turn ſuch engines as may raiſe a ſufficient quantity of water to do it. The moſt uſeful engine for this purpoſe is the perſian wheel. See the article PERSIAN WHEEL.

Where there are no ſtreams to turn this wheel, the farmers have recourſe to pumps and other engines moved by the wind. Lands that lie low, near brooks, give more frequent opportunities for theſe practices than thoſe which are near rivers; the brooks having greater falls, and the rivers running more ſlow and level: but when it can be effected by the waters of large rivers, the land is yet more enriched by it; theſe waters being much more fruitful than the others. When the water is by this engine thrown into the trough, it is to be conducted by it to the higheſt part of the land; and when that is ſufficiently flooded, the water is to be let into a large but not deep trench; ſeveral ſmall ones running out of which to all parts of the land, may convey it every where, and every part may be enriched by it. It is always proper to contrive this matter ſo, that the overflowing may be often repeated, and the water quickly carried off: for when it is ſuffered to be long upon the land in winter, it is apt to breed ruſhes, and other coarſe plants, upon the ground. All waters are not proper for this purpoſe of overflowing of lands to enrich them: the waters of coal-mines, and other places where there is only ſulphureous minerals mixed among them, being apt to deſtroy and kill the graſs wherever they come. Land-floods are the beſt to overflow with

in

in winter, and warm fattening ſprings in ſummer. It muſt be obſerved, that the water of one operation is dried, before any more is let on. It is always beſt alſo to do it at night, that the moiſture may be ſoaked into the ground before the heat of the day. The waſhings of towns, and of public highways, is a great improvement to lands; as is alſo the waſhings of lands where ſheep feed. Cold clay lands, and other ſtrong lands that lie flat will only be improved by overflowing them with land-floods, and that only in ſummer.

OVER-GROWN, on board a ſhip. When the waves of the ſea grow high, the mariners call it rough-ſea; but when the ſurges and billows grow higher, then it is an over-grown ſea.

OVER-HALE, in the ſea-language. A rope is ſaid to be overhaled when drawn too ſtiff, or haled the contrary way.

OVER-HALE *the runner*. See RUNNER.

OVER-RAKE, among ſeamen: when a ſhip, riding at anchor, ſo overbeats herſelf into an head-ſea, that ſhe is waſhed by the waves breaking in upon her, they ſay the waves over-rake her.

OVER-REACH, in the manege, is when a horſe ſtrikes his hind-feet againſt his fore. The word is alſo uſed for a ſtrain or painful ſwelling of the maſter-ſinew of an horſe, occaſioned by ſuch over-reach.

OVER-RIDING, in the manege, the ſame with over-done, *ſupra*.

OVER RULING *an objection*, in law, is the rejecting or ſetting it aſide by the court.

OVER-RUNNING, among printers. See the article PRINTING.

OVERSEERS *of the poor*, are public officers appointed by ſtatute in every pariſh, to provide for the poor therein; and ſometimes they are two, three, or four, according to the largeneſs of pariſhes. See the article POOR.

OVERSET, or OVERTHROW, in the ſea-language. A ſhip is ſaid to overſet, when her keel turns uppermoſt; which misfortune is occaſioned either by bearing too much ſail, or by grounding her ſo that ſhe falls upon one ſide.

OVERFLACKEE, an iſland of the united Netherlands, in the province of Holland, ſituated in the mouth of the river Maes, having the iſland of Voorn on the north, Brabant on the eaſt, the iſland of Schowen on the ſouth, and the Goree on the weſt.

OVERT, the ſame with open: thus an overt-act ſignifies an act which, in law, muſt be clearly proved; and ſuch is to be alledged in every indictment for high treaſon.

OVERTURE, or OUVERTURE, opening or preluding; a term uſed for the ſolemnities at the beginning of a public act or ceremony; an opera, tragedy, concert of muſic, *&c.*

The overture of the theatre, or ſcene, is a piece of muſic uſually ending with a fugue: the overture of a jubilee is a general proceſſion, *&c.*

OVERYSCHE, a town of the Auſtrian Netherlands, in the province of Brabant, ſituated on the river Yſche, nine miles north-eaſt of Bruſſels.

OVERYSSEL, one of the United Provinces, bounded by Groningen on the north, by Weſtphalia on the eaſt, by Zutphen on the ſouth, and by Guelderland, the Zuyder-ſea, and Frieſland on the weſt.

OVICULUM, in the antient architecture, a little ovum, or egg: ſome alſo uſe the word oviculum for ovolo. See OVOLO.

OVIEDA, in botany, a genus of the didynamia-angioſpermia claſs of plants, the corolla whereof is a ringent ſingle petal; the tube of the corolla is very long and ſmall; the upper lip is concave and emarginated; the lower one is divided into three equal ſegments: the fruit is a globoſe berry, containing two roundiſh ſeeds.

OVIEDO, a city of Spain, capital of the province of Aſturias: ſituated on the river Aſta, fifty miles north of Leon, in weſt long. 6° 40′, north lat. 43° 30′.

OVILIA, or SEPTA, in antient Rome, a place in the campus martius, at firſt railed in like a ſheep-pen, whence its name. Afterwards it was mounted with marble, and beautified with walks and galleries, as alſo with a tribunal, or ſeat of juſtice. Within this precinct, or encloſure, the people were called in to give their ſuffrages for the election of magiſtrates. The aſcent into the ovilia was not by ſtairs, but by pontes, or narrow boards, laid there for the occaſion; on which account *de ponte dejici* was to be denied the privilege of voting; and perſons thus dealt with, were called depontani.

OVIPAROUS, a term applied to ſuch animals as bring forth their young, *ab ovo*, from eggs; as birds, inſects, *&c.* See the article EGG.

The oviparous kind ſtand in oppoſition to thoſe which bring forth their young alive, called viviparous animals, as man,

man, quadrupeds, &c. Oviparous animals may be ſaid to be ſuch as conceive eggs which they afterwards bring forth, and from which, by the incubation of the parent, or ſome other principle of warmth and fermentation, at length ariſe animals; which, after they have ſpent the moiſture or humour they have been ſurrounded withal, and are grown to a ſufficient bulk, firmneſs and ſtrength, break their ſhell and come forth. The oviparous kind, beſides birds, include divers other ſpecies of terreſtrial animals.

OVIS, the SHEEP, in zoology. See the article SHEEP.

OULNEY, a market-town of Buckinghamſhire, ſituated nine miles ſouth-eaſt of Northampton.

OULZ, a town of Italy, in the province of Piedmont, ſituated in eaſt long. 6° 30°, north lat. 45°.

OUNCE, *uncia*, a little weight, the ſixteenth part of a pound-avoirdupois, and the twelfth part of a pound-troy: the ounce-avoirdupois is divided into eight drams, and the ounce-troy into twenty penny-weights. See WEIGHT.

OUNCE, *lynx*, in zoology. See the article LYNX.

OUNDLE, a market-town of Northamptonſhire, ſituated on the river Nen, twenty-two miles north eaſt of Northampton.

OVOLO, or OVUM, in architecture, a round moulding, whoſe profile, or ſweep, in the ionic and compoſite capitals, is uſually a quadrant of a circle: whence it is alſo commonly called the quarter round. It was uſually enriched with ſculpture by the antients, in the form of cheſnut-ſhells; whence Vitruvius, and others, called it echinus, *i. e.* cheſnut-ſhell. See the article MOULDING.

Among us, it is uſually cut with the repreſentation of eggs and anchors, or arrows heads placed alternately.

OURAN, the name of an imaginary ſect of magicians, in the iſland of Gromboccanore, in the Eaſt-Indies; where they are ſuppoſed to have the art of rendering themſelves inviſible, and paſſing where they pleaſe, and by theſe means doing infinite miſchief.

OUROLOGY, in medicine, a name given by authors to a treatiſe or diſcourſe on the ſubject of urine. See the article URINE.

OUSE, a river, which riſing in the north of Yorkſhire, runs ſouth-eaſt by York; and, continuing that courſe, falls into the Trent.

OUSE is alſo a river which riſes on the confines of Oxfordſhire and Buckinghamſhire, and running north-eaſt through Buckinghamſhire, Bedfordſhire, Huntingdonſhire, Cambridgeſhire, and Norfolk, paſſes by Buckingham, Bedford, Huntingdon, and Ely, diſcharging itſelf into the bay of the German ſea at Lynn.

OUSTED, in our old law-books, the being removed or put out of poſſeſſion.

OUSTER LE MAIN, a writ antiently granted and directed to the eſcheator, on a petition for the ſame purpoſe, to deliver ſeiſin out of the king's hand to the party who ſued out the writ, becauſe the lands ſeiſed were not held of the king; or that he ought not to have the wardſhip of them, &c. It is likewiſe taken to be the judgment given in a monſtrans de droit: but all ouſter le mains, wardſhips, liveries, &c. are now taken away.

OUSTER LE MER, in law, ſignifies a cauſe of excuſe given to the court on a defendant's not appearing upon ſummons, by alledging that he was then beyond the ſeas.

OUSTIACH, or OSTIACH *country*, is a part of Aſiatic Ruſſia, extending along the river Irtis to its confluence with the river Oby, and from thence northward along the banks of the Oby and Jeniſa, into the gulph of the Manga-ſea, or the frozen ocean; and extending alſo along the banks of ſeveral rivers which fall into the Oby and Jeniſa.

OUTFANGTHEF is taken for an antient privilege of the lord, when a felon, dwelling in his manor, was taken out of his fee; in which caſe, he might cauſe him to be brought back to judgment in his own court.

OUT-HOUSES are ſuch as belong and are adjoining to dwelling houſes.

OUT-LAND, among the Saxons, was that land which lay beyond the demeſnes, and was granted out to tenants; though at the will of the lord, in like manner as copyhold eſtates.

OUT-LAW, ſignifies one that is deprived of the benefit of the law, and therefore held to be out of the king's protection. See the next article.

Where an original writ, and the writs of capias, alias, and pluries, have been iſſued againſt a perſon, and are returned by the ſheriff, non eſt inventus, and after proclamation made for him to appear, &c.

&c. if he omits ſo doing, he then becomes out-lawed: though, formerly, no perſon could be out lawed, except in the caſe of felony; which being puniſhable by death, any perſon was at liberty to ſlay the out-law; but that is now altered, and no perſon but the ſheriff, on a lawful warrant, may put a perſon out-lawed for felony to death. An infant under age, or a woman who is never ſworn to allegiance, cannot be an out-law, though the latter is ſaid to be waived. See the article WAIVE.

OUTLAWRY, is where a perſon is outlawed, and on that account loſes the benefit of a ſubject. See the preceding article.

The proceſs of outlawry lies in indictments of treaſon or felony, and alſo of treſpaſs vi & armis, conſpiracy, *&c.* And by ſtatute, perſons may be out-lawed in many civil actions, as debt, caſe, covenant, *&c.* On an outlawry for felony the perſon forfeits his lands, goods, and chattels; in perſonal actions, the goods and chattels of the perſon are only liable, and they are forfeited to the king, with the profits of his chattels real, by a neceſſary conſequence, that the party being extra legem, is therefore incapable to take them himſelf. In the caſe of either treaſon or felony, an outlawry may be reverſed by writ of error, or plea; and the judgment upon the reverſal is, that the party ſhall be reſtored to all that he loſt, *&c.* however, he muſt plead to the indictment againſt him. If a party outlawed in a civil cauſe, does come in gratis, on the return of the exigent, alias, or pluries, he may, by motion, reverſe the outlawry, without putting in of bail: but in caſe he comes in upon a cepi corpus, he ſhall not be permitted to do it, unleſs he appear in perſon, or give bail to the ſheriff for his appearance on the return of the cepi. When an outlawry is after judgment, it cannot be reverſed, till ſatisfaction is acknowledged of record by the plaintiff, or the defendant has brought the money recovered into court: and on reverſal of an outlawry, the plaintiff may declare againſt the defendant for the ſame matter, in two terms, on a new original, and in another county, beſides that wherein the action was firſt laid.

OUTLICKER, in a ſhip, a ſmall piece of timber made faſt to the top of the poop, and ſtanding out right a-ſtern. At the outmoſt end thereof is a hole, into which the ſtanding part of the ſheet is reeved, through the block of the ſheet; and then again through another block, which is ſeized cloſe by the end of this outlicker. It is ſeldom uſed in great ſhips, except the mizen-maſt is placed ſo far aft, that there is not room within-board to hale the ſheet flat.

OUT-RIDERS, certain bailiffs-errant, that are employed by ſheriffs, to ride to the farthermoſt parts of counties, or hundreds, in order to ſummon people more ſpeedily to county courts, *&c.*

OUTWARD *flanking angle*, or *The angle of the tenaille*, in fortification, is comprehended by the two flanking lines of defence.

OUTWORKS, in fortification, all thoſe works made without-ſide the ditch of a fortified place, to cover and defend it.

Outworks, called alſo advanced and detached works, are thoſe which not only ſerve to cover the body of the place, but alſo to keep the enemy at a diſtance, and prevent his taking advantage of the cavities and elevations uſually found in the places about the counterſcarp, which might ſerve them either as lodgments, or as rideaux, to facilitate the carrying on their trenches, and planting their batteries againſt the place: ſuch are ravelines, tenailles, hornworks, queve d'arondes, envelopes, crown-works, *&c.* See the article RAVELIN, TENAILLE, *&c.*

It is a general rule in all outworks, that if there be ſeveral of them, one before another, to cover one and the ſame tenaille of a place, the nearer ones muſt gradually, one after another, command thoſe that are farther advanced out into the champaign, that is, muſt have higher ramparts, that ſo they may overlook and fire upon the beſiegers, when they are maſters of the more outward works.

OUVERTURE. See OVERTURE.

OVUM PHILOSOPHICUM, or CHEMICUM, a glaſs-body, of an oval form, reſembling an egg, uſed for the ſublimation of mercury. See MERCURY.

OUZEL, or the *Water* OUZEL, in ornithology, the motacilla, with a black body and white breaſt. See MOTACILLA.

OWELTY, or OVELTY *of ſervices*, in our law-books, denotes an equality of ſervices; as in the caſe of a lord-meſne, and a tenant who holds the meſne, as he holds of the ſuperior lord.

OWL, in ornithology, the engliſh name of ſeveral ſpecies of the ſtrix. See STRIX.

The ſeveral ſpecies of ſtrix, that fall under this denomination, are very numerous.

merous. 1. For the great horn-owl, or eagle-owl, ſee the article BUBO.

2. The black and white horn-owl, or the white aurited ſtrix, is a beautiful bird, equal to a turkey in ſize, of a ſnow-white colour, elegantly variegated with ſpots and lines of black; the head is large, round, ſhort, and decorated in a very beautiful manner, with a pair of ears or horns, as they are uſually called, being tufts of erect feathers, having their origin from the verges of the apertures of the ears. 3. The leſſer horn-owl, being the ſtrix with the head aurited with ſix feathers, is another very beautiful bird, equal to a large pigeon in ſize, with very large wings; the wings are reddiſh, as is alſo the lower part of the belly and back. 4. The grey-owl, or the brown ſtrix, with a ſmooth head, with black eyes, and the primary wing-feathers ſerrated. 5. The yellow owl, with a ſmooth head. 6. The hazel-owl, or the brown ſtrix, with a ſmooth head, and the eyes brown. 7. The yellow-eyed owl, or the brown ſmooth-headed ſtrix, with the iris of the eyes yellow. 8. The variegated tailed owl, or the brown ſmooth-headed ſtrix, ſpotted with white, and with white faſciæ on the tail. 9. The little owl, or the brown ſtrix, with a ſmooth head, and five ſeries of ſpots on the wing feathers. This is an extremely pretty little bird, and ſo ſmall, that it appears ſingular to ſee the marks of this genus on it. It is about the bigneſs of the black-bird, and its wings are very long. 10. The white-owl, or the white ſtrix, with a ſmooth head, being nearly equal to a gooſe in bigneſs. 11. The common brown-owl, or jay-owl, being the brown ſmooth-headed ſtrix, with the third of the wing-feathers longeſt, and about the ſize of a pigeon. 12. The german horn-owl, or the horn-owl with a long tail. 13. The church-owl, or the leſſer horn-owl, being the variegated-backed, ſmooth headed ſtrix. 14. The white-beaked owl, or the ſmooth-headed ſtrix, with a bluiſh, grey back, and a whitiſh beak. And, 16. The yellow-beaked american owl, or the yellow-beaked ſtrix, with a brown body, variegated with white.

OWLER, any perſon who conveys wool, *&c.* to the ſea-ſide in the night-time, there to be ſhipped, contrary to law.

OWSE, among tanners, oaken bark beaten or ground ſmall, to ſerve in the preparation of leather.

OX, *bos*, in zoology, makes a genus of quadrupeds. See the article BOS.

The common ox is too well known to need a particular deſcription: the bull is a very heavy, but at the ſame time a ſtately and fierce-looking animal, with wide noſtrils, large eyes, and long and patulous ears; his forehead is decorated with ſhort curled hair, and the ſkin hangs looſe under his throat: for the properties of a bull, kept for breeding, ſee the article BULL.

When theſe creatures are intended to breed, the better the land is, the larger ſort of beaſts is to be choſen, and the greater will be the profit. But of whatever ſort the breed is, the bull ſhould always be of the ſame country with the cow, otherwiſe it never ſucceeds ſo well. See the article COW.

The largeſt oxen are to be choſen for work, and for feeding, but then it muſt be where there is land rich enough to maintain them. When they are to draw, care muſt be taken to match them well, both for height and ſtrength; for if one be ſtronger than the other, the weakeſt will ſoon be deſtroyed. They muſt never be driven beyond their natural pace, for the beating them throws them into ſurfeits, and many other diſeaſes. The time of putting oxen to work is at three years old; they muſt be worked gently the firſt year, eſpecially in hot weather, and fed with a large quantity of hay: this will enable them to bear their labour better than graſs; and they ſhould be always kept in a middle ſtate, neither too fat nor too lean. They may be worked till they are ten or twelve years old, and then ſold.

Diſeaſes of OXEN. As ſcarce any creature is more uſeful to man than the ox kind, nothing is more worthy conſideration than the nature and origin of their diſeaſes, and the remedies for them. The ſame diſtemper that has of late years carried off ſuch vaſt numbers of theſe cattle with us and elſewhere, has at other times raged in Italy. In the year 1710, and the ſucceeding one, there was a great mortality among the horned cattle there, and the occaſion of it was evidently the unnatural ſeaſon preceding. The whole autumn before had been wet, and at the time of the winter ſolſtice there were continual cold winds, and ſmall, but laſting rains. The ſpring that ſucceeded was alſo cold and rainy, and the defect of heat, and abundance of moiſture, made

a change in the whole face of nature: the medicinal ſprings had not their wonted effect; and the fruits of the earth could not appear at their proper ſeaſons, nor in their due perfection. The graſs was injured by this, and the ground rendered continually damp and unwholeſome: and to this was evidently owing the malignant and contagious diſeaſe that raged among the cattle afterwards. It was ſuppoſed at that time with them, as of late with us and elſewhere, that the contagion was brought in among their oxen by ſtrange cattle coming from infected places, but this proved to be an error; for if an ox was removed to ever ſo diſtant a paſture, he never eſcaped the better for it: the whole earth and its productions were vitiated throughout the country, and there was no ſafety in any part of it.

The uſe of this obſervation muſt be, the keeping the cattle in ſucceeding years out of the way of thoſe things which occaſion their ſickneſſes in ſuch as theſe. If the autumn or winter be extremely cold and wet, remove the cattle out of the low grounds, and put them to feed in ſandy, dry ſoils, on the high grounds; give them water from ſuch places where the ſun has moſt power, and it is leſs chilling cold than in others; and in caſes of imminent danger, always mix ſome ſalt in it. If the bad weather continues, let them always have clean ſtraw to lie on, and a dry covering; and in caſes where the contagion is already begun, the fumigating the houſes where they are kept with bay leaves and eleutherian bark, is judged convenient. As to remedies, when they are once ſeized with the diſtemper, it is hard to underſtand what intention to preſcribe in, and how to aſcertain the doſes; and as the late practice, in attempting to cure, has been of very little ſervice, the cautions for preventing the diſeaſe ought to be redoubled, to avoid an almoſt incurable misfortune.

OXALIS, or OXYS, WOOD SORREL. See the article *Wood* SORREL.

OXFILD, in our old writers, is ſaid to be a reſtitution made by a county, *&c.* for any wrong done in the ſame. See the article HUE and CRY.

OXFORD, the capital city of Oxfordſhire, and the ſee of a biſhop; it is ſituated at the confluence of the Iſis and Cherwell, fifty-five miles weſt of London: weſt long. 1° 15′, and north lat. 51° 45′.

Oxford is moſt remarkable on account of its univerſity, which conſiſts of twenty colleges and five halls: this city ſends two members to parliament, and the univerſity as many.

OXGANG, or OXGATE, is generally taken, in our old law-books, for fifteen acres, or as much ground as a ſingle ox can plough in a year.

OXUCIÆ, in natural hiſtory, the name of a genus of foſſils of the claſs of the ſelenitæ, but of the columnar, not the rhomboidal kind. The ſelenitæ of this genus conſiſt of ſix equal planes, having their top or bottom no broader or more depreſſed than the others; and in this differing from the iſchnambluces, or flatted columnar ſelenitæ, as they do from the iſambluces or cryſtaliform, but broken ended ones, by having their ends naturally tapering off to a point. The bodies of this genus, like thoſe of the other genera of the columnar ſelenitæ, are liable to a longitudinal crack in their middle; and this ſometimes includes a little clay, in form of an ear of graſs. See the article SELENITÆ.

Of this genus there are only two known ſpecies. 1. A fine kind, with thin flakes and tranſverſe filaments, found in the clayey banks of the river Nen, near Peterborough, in Northamptonſhire; and, 2. A dull kind, with thick plates and longitudinal filaments. This is not uncommon in Yorkſhire, and lies ſometimes in a yellow, ſometimes in a blue clay.

OXUS, a river which riſes in the mountains on the north of India, and running northweſt, through Uſbec Tartary, afterwards ſeparates Perſia from Uſbec Tartary, and falls into the Caſpian ſea, in 44° north latitude.

OXYCOCCUS, in botany, a ſpecies of vaccinium. See VACCINIUM.

OXYCRATE, *oxycratum*, in pharmacy, *&c.* a mixture of vinegar and water, proper to aſſwage, cool, and refreſh: they make fomentations of oxycrate, clyſters of oxycrate, *&c.* The uſual proportion is one ſpoonful of vinegar to five or ſix ſpoonfuls of water.

OXYCROCEUM, in pharmacy, *&c.* a preparation much uſed in plaſters for fractures, *&c.* made as follows: take yellow wax, one pound; pitch and galbanum, each half a pound: melt them over a gentle fire; and then add of venice-turpentine, myrrh, and olibanum, each three ounces; ſaffron, two ounces: make them into a plaſter.

OXYGLYCU, a ſpecies of drink prepared of the ſweeteſt honey-combs, macerated and boiled. The combs from which all the honey has been expreſſed, are put into a pot with pure water, and boiled till they ſeem to have depoſited all their contained honey in the water. This liquor is to be kept, and, when diluted with cold water, is to be drank in the ſummer-time, in order to remove thirſt.

OXYMEL, in pharmacy, a compoſition of vinegar and honey.

There are ſeveral ſorts of oxymel, whereof the ſimple kind is made by boiling, in a glazed earthen-veſſel, and with a gentle fire, two pounds of clarified honey, in a pint of vinegar, to the conſiſtence of a ſyrup.

The chief compound oxymels, are oxymel of garlic, and oxymel of ſquills.

Oxymel of garlic is thus made: take of garlic, ſliced, an ounce and an half; caraway-ſeeds, and ſweet-fennel-ſeeds, of each two drams; of clarified honey, ten ounces; of vinegar, half a pint: boil the vinegar a little while in a glazed earthen-veſſel, with the ſeeds bruiſed; then add the garlic, and cover the veſſel; after all is cold, preſs out the liquor; and, with the heat of a balneum, diſſolve in it the honey.

Oxymel of ſquills is made by boiling three pounds of clarified honey in a quart of vinegar of ſquills, over a gentle fire, to the conſiſtence of a ſyrup.

In all the oxymels, a metalline veſſel muſt be avoided, leſt it ſhould be corroded by the vinegar.

OXYRRHODIUM, in pharmacy, a compound medicine, made of four or five parts of oil of roſes, and one of vinegar.

It is uſed in inflammations, and to dry up tetters.

OXYSACCHARUM, a liquid medicine prepared of ſugar and vinegar.

OYER, in law-books, ſeems to have been antiently uſed for what is now called aſſiſes. See the article ASSISE.

OYER AND TERMINER, a commiſſion directed to the judge of aſſiſe, and other gentlemen, impowering them to hear and determine all criminal cauſes, and to try all offenders, whether for treaſon, felony, or treſpaſs.

On the general commiſſion of oyer and terminer, there goes a precept to the ſheriff, in the name of the juſtices, bearing date fifteen days before their ſeſſions, in order to return twenty-four perſons, for a grand-jury, on ſuch a day. See JURY. Theſe juſtices have power to proceed only upon indictments that are brought before them, unleſs they have likewiſe a commiſſion of gaol-delivery, or a ſpecial one; which, it is ſaid, may be granted to enquire of oppreſſions and extortions of under-ſheriffs, bailiffs, clerks of the market, and all other officers, on the complaint of any one who will ſue out the ſame.

OYER *of a deed*, a petition to hear and peruſe any deed, upon which an action is brought. This is always granted the defendant, who may alſo take a copy of it, that he may conſider what to plead to the action. It is held, that where executors bring an action of debt, the defendant may crave oyer of the will.

There is alſo oyer of a record, wherein the plaintiff or defendant moves the court, that they will hear or look upon a record.

OYES, or OYEZ, ſignifies *hear ye*; and is frequently uſed by the cryers in our courts, on making proclamations, or to enjoin ſilence.

OYSTER, or OISTER, *oſtrea*, in zoology, a genus of bivalve ſhell-fiſh, the lower valve of which is hollowed on the inſide, and gibboſe without; the upper one is more flat; and both are compoſed of a multitude of laminæ or cruſts, and uſually ſcabrous or rough on the outer ſurface: ſome oyſter-ſhells are alſo furniſhed with tubercles, or ſpines, and others are deeply furrowed and plicated: the figure of moſt is roundiſh, but in ſome it is quite irregular.

Oyſter-ſhells are accounted drying and abſtergent, and given internally, ſudorific.

OZÆNA, ὀζαινα, in ſurgery, a foul and malignant ulcer of the noſe, diſtinguiſhed by its fœtor, and often accompanied with a caries of the bones of the noſe.

An ozæna generally proceeds from a foulneſs of the blood, and eſpecially when it is affected with the ſcurvy or venereal diſeaſe; tho' ſometimes it proceeds from acrimonious or cauſtic ſubſtances drawn into the noſe along with the breath.

As to the cure, ſuch medicines ſhould be uſed, as ſerve to correct the blood, and rectify the depraved habit of body; of which mercurials, and decoctions of the woods, are the chief; and in the mean time the patient's diet ſhould be ſpare and light,

light, and without ſeaſoning; and, when owing to a venereal cauſe, nothing proves ſo effectual as a ſalivation.

Externally, ſuch topical medicines muſt be applied as ſerve to deterge ulcers, as the aqua virid. Hartmanni, applied with tents or linen-rags rolled up. A mixture of lime-water with mercurius dulcis may be likewiſe uſed with ſucceſs. You will alſo find great benefit in the worſt kind of the diſorder, from a decoction of ſavin and ſcordium, in a pound of which muſt be diſſolved an ounce of the unguent. fuſc. Wurtz. uſed warm; or an injection of ſpirit of wine, in which is diſſolved ſome honey of roſes and mercurial ointment. Some uſe an injection of oil of ſweet almonds, an ounce, with a dram of oil of caſtor, to ſoften the acrimony of the humours; others, again recommend tobacco-leaves, or tobacco-ointment; and others uſe precipitate, mixed with an emollient ointment, and applied with tents: if the pain be great, they add to theſe medicines, a ſcruple of camphor and ſaffron, with half a ſcruple of opium. Laſtly, fumigating with cinnabar is recommended; in the uſe of which medicines, the patient muſt continue, at leaſt, till the ſtench and diſcharge of corrupt matter ceaſe. When the matter is well digeſted, the running abated, and the pain gone, the ulcer may be cicatrized with lotions, and waſhed with warm milk. If it gathers to a cruſt, it may be removed by oil of ſweet almonds, or by a powder made of roſemary and lavender-flowers, dried-lemon-peel, and common ſnuff.

When the ozæna is accompanied with a caries, it is hardly curable, before a ſeparation of the carious bone is obtained, which may ſometimes be effected by pliers, or a pair of ſciſſars.

Sometimes the ozæna is ſituated in the ſinus of the upper jaw; in which caſe Dr. Drake adviſes to extract one of the dentes molares, and then to open a paſſage through the alveolus or ſocket, into the ſinus, by a probe or other ſharp-pointed inſtrument: by this opening the offending matter may not only be diſcharged, but you may throw in proper injections, compoſed of elixir proprietatis, or tincture of myrrh and aloes, either alone, or mixed with a decoction of ſavin and ſcordium, with ſome honey of roſes; which muſt be retained in the ſinus for ſome time, by ſtopping up the paſſage: then, after the injection is diſcharged, a tent, tied to a thread, is to be inſerted, to prevent the paſſage from cloſing up, before the ulcer is thoroughly deterged; after which, the cure may be completed with balſamics.

P.

P, or p, the fifteenth letter, and eleventh conſonant of the alphabet; the ſound of which is formed by expreſſing the breath ſomewhat more ſuddenly than in forming the ſound of b: in other reſpects, theſe two ſounds are very much alike, and are often confounded one with another. When *p* ſtands before *t* or *ſ*, its ſound is loſt, as in the words *pſalms*, *pſychology*, *ptolemaic*, *ptiſan*, &c. when placed before *h*, they both together have the ſound of *f*, as in *philoſophy*, *phyſic*, &c.

As an abbreviature, P ſtands for Publius, pondo, &c. PA. DIG. for patricia dignatis; P. C. for patres conſcripti; P. F. for Publii filius; P. P. for propoſitum, or propoſitum publice; P. R. for populus romanus; PR. S. for prætoris ſententia; and PRS. P. for præſes provinciæ.

In the italian muſic, P. ſtands for piano, or ſoftly; PP. for piu piano, *i. e.* more ſoftly; and PPP. for pianiſſimo, or very ſoftly.

Among aſtronomers, P. M. is uſed to denote poſt meridiem, or afternoon; and ſometimes for poſt mane, *i. e.* after midnight.

As a numeral, P. ſignifies the ſame as G. *viz.* 400; and with a daſh over it, thus $\overline{P}$, 400,000.

Among phyſicians, P. denotes pugil, or the eight part of an handful; P. Æ. partes æquales, or equal parts of the ingredients; P. P. ſignifies pulvis patrum,

i. e.

i. e. the jeſuits-powder; and ppt. præparatus, prepared.

PABULUM, FUEL, among natural philoſophers and chemiſts. See the articles FUEL and FIRE.

PACALIA, a feſtival obſerved by the Romans, in honour of the goddeſs Pax, or Peace.

PACAMORES, a province of Peru, on the confines of Amazonia.

PACE, *paſſus*, a meaſure taken from the ſpace between the two feet of a man, in walking; uſually reckoned two feet and an half, and in ſome men a yard or three feet. See the article MEASURE.

The geometrical pace is five feet; and 60000 ſuch paces make one degree of the equator. See the article DEGREE.

PACE, in the manege, is of three kinds, *viz.* walk, trot, and gallop; to which may be added an amble, becauſe ſome horſes have it naturally. See the articles WALK, TROT, *&c.*

Horſes which go ſhuffling or mixed paces, between the walk and amble, are for the moſt part of no value; which commonly proceeds from their fiery temper, and ſometimes from a weakneſs in their reins or legs.

PACHAMAC, a temple of Peru, in South America, dedicated by the Indians to the ſupreme being: it gives its name to the adjacent country.

PACHODECARHOMBIS, in natural hiſtory, the name of a genus of foſſils, of the claſs of the ſelenitæ, expreſſing a thick rhomboidal body, compoſed of ten planes. See the article SELENITÆ.

The characters of this genus are, that the ſelenitæ of it conſiſt of ten planes; but as the top and bottom in the leptodecarhombes, or moſt common kind of the ſelenitæ, are broader and larger planes than any of the reſt, the great thickneſs of this genus, on the contrary, make its four longer planes in all the bodies of it, meeting in an obtuſe angle from its ſides, its largeſt planes. Of this genus there are only four known ſpecies. 1. A very pellucid one, with ſlender tranſverſe ſtriæ. This is frequent in the clay-pits of Northamptonſhire, and ſome other countries; and the common people have an opinion, that it is good to ſtop hæmorrhages; whence it has acquired among them the common name of ſtaunch. 2. A dull-looking kind, with very fine tranſverſe filaments. This is found in the clay-pits of Northamptonſhire, Staffordſhire, and Yorkſhire. 3. A fine and beautiful kind, with very ſlender longitudinal filaments. This is common in Yorkſhire, and ſeems almoſt peculiar to that country; it is not only found there in digging, but frequently lies on the ſurface of the earth. And, 4. A brown pellucid kind, found very frequently in Germany, and ſometimes in England.

PASCHU, an iſland in the Mediterranean, near the coaſt of Epirus, in european Turky, ſubject to Venice: eaſt long. 20° 45′, and north lat. 39° 15′.

PACIFIC OCEAN, or SOUTH-SEA, that vaſt ocean which ſeparates Aſia from America: it is called Pacific, from the moderate weather the firſt mariners who ſailed in it, met with between the tropics; and it was called South-ſea, becauſe the Spaniards croſſed the iſthmus of Darien from north to ſouth, when they firſt diſcovered it: though it is properly the Weſtern ocean, with regard to America.

PACIFIC LETTERS. See the article *Pacific* LETTERS.

PACIFICATION, in matters of polity, ſignifies the reſtoring of the public tranquility. Hence,

PACIFICATOR ſignifies much the ſame with mediator, or one who endeavours to reconcile princes or ſtates at variance. See the articles PEACE and TREATY.

PACK, in commerce, denotes a quantity of goods, made up in loads, or bales, for carriage.

A pack of wool is ſeventeen ſtone and two pounds, or a horſe's load.

PACKAGE, is a ſmall duty of one penny in the pound, paid for all goods not particularly rated.

PACKERS, perſons whoſe employment it is to pack up all goods intended for exportation; which they do for the great trading companies and merchants of London, and are anſwerable if the goods receive any damage through bad package.

PACOS, in zoology, a ſpecies of peruvian camel, without any gibboſity, erroneouſly reckoned by ſome a ſheep: it is only three feet and an half high, from the ground to the top of the back; but the neck is very long, ſo that when the head is carried erect it is pretty tall. See the article CAMEL.

Like the glama, it is ſometimes employed in carrying burdens: its fleſh is very well taſted.

PACT, or PACTION, *pactum*, in law, denotes a contract, or agreement, between two or more parties. See CONTRACT.

PACTA,

PACTA CONVENTA, in Poland, are the articles agreed on between the king and the republic, which they mutually oblige each other to obſerve.

PACTOLUS, a river of Lydia, in the leſſer Aſia, celebrated by the antient poets for its golden ſands.

PADANG, a port-town on the weſt coaſt of the iſland of Sumatra, in the Eaſt-Indies, in poſſeſſion of the Dutch: eaſt long. 99°, ſouth lat. 1° 5′.

PADDLE, in glaſs-making, an inſtrument with which the workmen ſtir about the ſand and aſhes in the calcar. See the articles CALCAR and GLASS.

PADDOC, or PADDOC-COURSE, a piece of ground encompaſſed with pales or a wall, and taken out of a park for exhibiting races with grey-hounds, for plates, wagers, or the like.

A paddoc is generally a mile long, and a quarter of a mile broad; at one end a little houſe where the dogs are to be entered, and whence they are ſlipped; near which are pens to incloſe two or three deer for the ſport. Along the courſe are ſeveral poſts, *viz.* the low poſt, which is an hundred and ſixty yards from the dog-houſe and pens; the quarter of a mile poſt, half mile poſt, and pinching poſt; beſides the ditch, which is a place made to receive the deer, and preſerve them from farther purſuit. And near this place are ſeats for the judges choſen to decide the wager.

The keepers, in order to ſlip the dogs fairly, put a falling collar upon each, ſlipped through a ring, and the deer being turned looſe, and put forward by a teazer, as ſoon as he is arrived at the law poſt, the dog-houſe door is thrown open, and the dogs ſlipped. If now the deer ſwerve ſo much, as that his head is judged nearer the dog-houſe than the ditch before he arrive at the pinching-poſt, it is no match, and muſt be run over again three days after; but if the deer runs ſtraight beyond the pinching-poſt, then that dog that is neareſt when he ſwerves, or is blanched by any accident, wins the match; but if no ſuch ſwerve happens, then the match is won by the dog who firſt leaps the ditch.

PADERBORN, the capital of the biſhopric of the ſame name in Weſtphalia: eaſt long. 8° 25′, north lat. 51° 45′.

PADRON, a town of Spain, in the province of Galicia, fifteen miles ſouth of Compoſtella.

PADSTOW, a market-town of Cornwall, thirty miles weſt of Launceſton.

PADUA, the capital of the Paduan, in Italy, a city of a circular form, ſituated twenty-two miles weſt of Venice: eaſt long. 12° 15′, north lat. 45° 30′.

PADUAN, a province of Italy, in the territories of Venice, thirty-five miles long, and almoſt as much in breadth; bounded by the Treviſane, on the north; by the dutchy of Venice on the eaſt; by the Poleſin de Rovigo, on the ſouth; and by the Vicentin, on the weſt.

PADUAN, amongſt the medaliſts, a modern medal ſtruck in imitation of the antique; or a new medal ſtruck with all the marks and characters of antiquity. This name is properly applicable to thoſe medals only that were ſtruck, in the ſeventh century, by an italian painter, born at Padua; who ſucceeded ſo well in the impoſture, that the beſt judges are at a loſs to diſtinguiſh his medals from the genuine ones. Though it is frequently uſed in general for all medals of this kind.

PADUS, the LAUREL, or BIRD'S CHERRY, in botany, a ſpecies of prunus. See the article PRUNUS.

The fruit of this plant is recommended to be hung about the neck of children ſubject to epilepſies. It is of an emollient, and heating nature.

PÆAN, among the antient pagans, was a ſong of rejoicing ſung in honour of Apollo, chiefly uſed on occaſions of victory and triumph.

PÆAN, in the antient poetry, a foot conſiſting of four ſyllables; of which there are four kinds, the pæan primus, ſecundus, *&c.* See the article FOOT.

The pæan primus conſiſts of one long ſyllable and three ſhort ones, or a trochæus and a pyrrhichius, as *temporibus*; the pæan ſecundus conſiſts of a ſhort ſyllable, a long, and two ſhort, or an iambus and a pyrrhichius, as *potentia*; the pæan tertius conſiſts of two ſhort ſyllables, a long and a ſhort one, or a pyrrhichius and a trochæus, as *animatus*; the pæan quartus conſiſts of three ſhort ſyllables and a long one, or a pyrrhichius and iambus, as *celeritas*.

PÆDAGOGUE, or PEDAGOGUE. See the article PEDAGOGUE.

PÆDARTHROCACES, in ſurgery, a diſeaſe of the bones, raiſing them into tumours near the joints, and differing from the ſpina ventoſa, in that it is not attended either with violent pains or eroſion of the bone and adjacent parts. See the article SPINA VENTOSA.

This

This diſeaſe is moſt frequently found in the joints of children: for as the bones of children are more ſoft and ſpongy than the bones of adults and old perſons, they are ſo much the eaſier diſtended by humours, and more frequently form tumours. See CARIES and EXOSTOSIS.

PÆDEROTA, in botany, a genus of the diandria-monogynia claſs of plants, the corolla whereof conſiſts of a ſingle petal; the tube is cylindric, and of the length of the cup; the limb is formed as it were into two labia; the upper lip is oblong, hollow, and narrow; the lower lip is broader, and is divided into three equal ſegments at the extremity: the fruit is an oval capſule, compreſſed at the top, and bifid, compoſed of four valves, and containing two cells, in each whereof there are numerous, obtuſe, oblong ſeeds, which adhere to a columnar receptacle.

PÆDO-BAPTISM, infant-baptiſm, or that conferred on children. See BAPTISM.

PÆONIA, PIONY, in botany, a genus of the polyandria-digynia claſs of plants, the corolla whereof conſiſts of five roundiſh, concave petals, very large, patent, and narrow towards the baſe: the fruit conſiſts of two capſules, reflexo-patent, of an oblong, oval figure, hairy, containing each one cell, formed each of a ſingle valve, and opening longitudinally inwards: the ſeeds are numerous, oval, ſmooth, beautiful, and coloured. The number of the germina, though naturally two, varies greatly: in ſome flowers there are five.

The root of this plant is a very celebrated medicine in nervous caſes. We have inſtances well atteſted of epilepſies being ſolely cured by it. It is good alſo in all diſorders of the head, and in hyſteric complaints: it promotes the menſes, and removes obſtructions of the viſcera.

PAGAN, *paganus*, a heathen, gentile, or idolater; one who adores falſe gods. See the article PAGANISM.

PAGANALIA, certain feſtivals obſerved by the antient Romans in the month of January. They were inſtituted by Servius Tullius, who appointed a certain number of villages (pagi), in each of which an altar was to be raiſed for annual ſacrifices to their tutelar gods; at which all the inhabitants were to aſſiſt, and give preſents in money, according to their ſex and age, by which means the number of country-people was known. The ſervants upon this occaſion offered cakes to Ceres and Tellus, to obtain plentiful harveſts.

PAGANELLUS, in ichthyology, the name of a fiſh of the ſea-gudgeon or rock fiſh kind, called by authors gobius marinus. See the article GOBIUS.

This fiſh has a yellow tranſverſe line on the top of the firſt back-fin. It grows to about ſix inches in length, and is thick in proportion.

PAGANISM, the religious worſhip and diſcipline of pagans; or, the adoration of idols and falſe gods. See IDOLATRY.

The gods of paganiſm were either men, as Jupiter, Hercules, Bacchus, &c. or fictitious perſons, as Victory, Fame, Fever, &c. or beaſts, as in Egypt, Crocodiles, Cats, &c. or, finally, inanimate things, as Onions, Fire, Water, &c.

PAGE, a youth of ſtate retained in the family of a prince or great perſonage, as an honourable ſervant, to attend in viſits of ceremony, do meſſages, bear up trains, robes, &c. and at the ſame time to have a genteel education, and learn his exerciſes. The pages in the king's houſhold are various, and have various offices aſſigned them, as pages of honour, pages of the preſence chamber, pages of the back ſtairs, &c.

This word is uſed in the turkiſh ſeraglio for the children of tribute, or ſlaves who wait on the grand ſeignior: they are commanded by the chief aga, and conſtitute four claſſes, called oda's.

PAGE *of a book*. See PRINTING.

PAGEANT, a triumphal car, chariot, arch, or other like pompous decoration, variouſly adorned with colours, flags, &c. carried about in public ſhews, proceſſions, &c.

PAGO, an iſland in the gulph of Venice, ſeparated from the continent of Morlachia by a narrow channel; being forty miles long, and twelve broad, ſituated in eaſt long. 16° 12′, north lat. 45′.

PAGOD, or PAGODA, a name whereby the Eaſt-Indians call the temple in which they worſhip their gods.

Before they build a pagod, they conſecrate the ground as follows: after having encloſed it with boards or paliſadoes, when the graſs is grown on the ground they turn an aſh coloured cow into it, who ſtays there a whole day and night; and as cow-dung is thought by the Indians to be of a very ſacred nature, they ſearch for this ſacred depoſit, and having found it, they dig there a deep pit, into which they put a marble-pillar, riſ-

ing conſiderably above the ſurface of the earth. On this pillar they place the image of the god to whom the pagod is to be conſecrated. After this the pagod is built round the pit, in which the pillar is fixed. The pagod uſually conſiſts of three parts, the firſt is a vaulted roof ſupported on ſtone or marble-columns. It is adorned with images, and, being open, all perſons without diſtinction are allowed to enter it: the ſecond part is filled with groteſque and monſtrous figures, and no body is allowed to enter it but the bramins themſelves: the third is a kind of chancel, in which the ſtatue of the deity is placed: it is ſhut up with a very ſtrong gate. This word is ſometimes uſed for the idol, as well as for the temple.

PAGOD, or PAGODA, is alſo the name of a gold and ſilver-coin, current in ſeveral parts of the Eaſt-Indies. See COIN.

PAIN, *dolor*, is defined to be an uneaſy ſenſation ariſing from a ſudden and violent ſolution of the continuity, or ſome other accident in the nerves, membranes, veſſels, muſcles, *&c.* of the body; or, according to ſome, it conſiſts in a motion of the organs of ſenſe; and, according to others, it is an emotion of the ſoul occaſioned by theſe organs.

There are various kinds of pain, one is attended with pulſation, another with a ſenſe of incumbent weight, another with a tenſion; there is a pain which attends eroſion, inciſion, punction, and perforation, comprehended with theſe and the like differences under the name acute; and, laſtly, there is a pain attended with a torpor and numbneſs.

Beſides the above-mentioned, there are other diſtinctions of pain: thus ſome pains are fixed, others moveable and wandering, as it often happens in a redundance of humours: ſome pains are continual, and others intermittent; ſome intenſe, others remiſs; ſome again afflict the patient in the beginning of the diſeaſe, others afterwards; and ſometimes they ariſe on the critical day, ſometimes not; and to mention no more, ſome pains are ſeated in the external parts, others in the internal; ſome in the noble, others in the ignoble parts.

All pain proceeds from ſome injury done to the parts affected; and according to Galen, it proceeds either from a ſudden alteration of the part, or a new temperament ſuddenly induced, or elſe from a ſolution of continuity. The internal parts ſuffer pain from the violence of a fever, by which the nervous parts are dried and vellicated, or from an inflammation, an eryſipelas, ſome great obſtruction or abſceſs in the viſcera, or, laſtly, from a flatus. Now ſince theſe pains owe their riſe to ſuch cauſes, they are juſtly denominated bad, as well when alone, as when attendant on other diſtempers; for all pain exhauſts the ſtrength, promotes crudities, and impedes the concoction of the humours. The worſt pains are thoſe excited in the viſcera and noble parts; and of theſe the moſt pernicious on all accounts are pains affecting the viſcera in a violent manner, and of a long and conſtant duration, by which the natural heat of the viſcera is deſtroyed, or reſolved, and no room left to hope for a happy event.

Pain is mitigated or aſſuaged divers ways; as, 1. By diluting and ſoftening acrimonies with warm water mixed with flour, applied by way of drink, fomentation, clyſter, or bath. 2. By reſolving and waſhing away obſtructions by the ſame means, and reſolvents. 3. By relaxing the nervous veſſels with drinks, fomentations, baths, relaxants, anodynes, and aperients. 4. By correcting the acrimony itſelf with proper remedies. 5. By freeing the obſtruent, obſtructed, and acrimonious parts from the too great preſſure of the vital humours, and by ſoftening, ſuppurating, and depurating them. 6. By rebating or deadening the ſenſe by narcotics, either internally or externally. See the articles NARCOTICS, and ANODYNE.

For pains after delivery. See the article DELIVERY.

PAIN FORT ET DURE, in law, ſignifies a particular puniſhment inflicted on a perſon who being arraigned for felony, refuſes to put himſelf upon the common trial of God and his country, but inſtead thereof obſtinately ſtands mute: this puniſhment is vulgarly called preſſing to death. The judgment of this pennance is by the common law, and it is uſually practiſed as follows, *viz.* that the priſoner be remanded back to priſon, and put into ſome low dark room, and there laid flat on his back on the ground, without any other covering than what is neceſſary to hide his nakedneſs, and that his legs and arms be extended with cords to the four quarters of the room, at which time there is to be laid on his body as much weight, or more, than he

can bear, and all the time he is to have no other ſupport than the worſt of bread and water, and is not to drink the ſame day that he eats, nor eat the day he drinks, and in this condition to remain till he dies. See the article MUTE.

PAINTING, the art of repreſenting natural bodies, and giving them an appearance of life, by the turn of lines, and the degrees of colours.

Whoever would apply himſelf to painting, ſays that celebrated italian painter Leonardo da Vinci, muſt in the firſt place learn perſpective: this will enable him to diſpoſe things in their proper places, and to give the due dimenſions to each: having done this, he muſt learn to deſign; chooſing for that purpoſe ſome able maſter, who at the ſame time may give him ſome inſight into the colours of figures: he ought then to conſult nature, to confirm himſelf in what he has already learnt; and, laſtly, let him apply himſelf to the ſtudy and imitation of the greateſt maſters, in order to get a habit of reducing what he has learnt into practice. See the articles DRAWING, DESIGN, PERSPECTIVE, &c.

To judge of the goodneſs of a painting, ſays Mr. Richardſon, it is neceſſary to eſtabliſh to ourſelves a ſyſtem of rules to be applied occaſionally; and to aſſiſt the judgment herein, the following rules have been laid down: 1. The ſubject muſt be finely imagined, and, if poſſible, improved in the painter's hands; he muſt think well as an hiſtorian, poet, philoſopher, or divine, and more eſpecially as a painter, in making a wiſe uſe of all the advantages of his art, and in finding expedients to ſupply its defects. 2. The expreſſion muſt be proper to the ſubject, and the characters of the perſons: it muſt be ſtrong, ſo that the dumb ſhew may be perfectly and readily underſtood: every part of the picture muſt contribute to this end; colours, animals, draperies, and eſpecially the actions of the figures, and above all the airs of the heads. 3. There muſt be one principal light, and this, and all the ſubordinate ones, with the ſhadows and repoſes, muſt make one entire and harmonious maſs; the ſeveral parts muſt be well connected and contraſted, ſo as to render the whole as grateful to the eye, as a good piece of muſic to the ear. By this means the picture is not only more delightful, but better ſeen and comprehended. 4. The drawing muſt be juſt; nothing muſt be flat, lame, or ill-proportioned; and theſe proportions ſhould vary according to the characters of the perſons drawn. 5. The colouring, whether gay or ſolid, muſt be natural, beautiful and clean, and what the eye is delighted with, in ſhadows, as well as lights and middle tints; and whether the colours are laid on thick, or finely wrought, they muſt appear to be done by a light and accurate hand. Laſtly, nature muſt be the foundation that muſt be ſeen at the bottom; but nature muſt be raiſed and improved, not only from what is commonly ſeen, to what is but rarely met with, but even yet higher, from a judicious and beautiful idea in the painter's mind, ſo that grace and greatneſs may ſhine throughout, more or leſs according to the ſubject. See COLOURING, CLARO-OBSCURO, &c.

Painting is of various kinds, according to the materials uſed, the matter upon which they are applied, and the manner of applying them; as painting in oil, in water-colours, freſco, &c.

PAINTING *in oil*. The whole ſecret of painting in oil conſiſts in grinding the colours with nut-oil, or linſeed-oil; but the manner of working is very different from that in freſco, or in water, by reaſon the oil does not dry near ſo faſt, which gives the painter an opportunity of touching and re-touching all the parts of his figures as often as he pleaſes; which in the other methods of painting is a thing impracticable. The figures done in oil, are alſo capable of more force and boldneſs; inſomuch that the black becomes blacker, when ground with oil, than with water; beſides, all the colours mixing better together, makes the colouring the ſweeter, more delicate and agreeable, and gives an union and tenderneſs to the whole, inimitable in any of the other manners.

Painting in oil is performed on canvas, on walls, wood, ſtone, and all ſorts of metals. 1. Painting on cloth or canvas is done as follows: the canvas being ſtretched on a frame, give it a layer of ſize, or paſte water, and then go over it with a pumice-ſtone, to ſmooth off the knots. By means of the ſize, the little threads and hairs are all laid cloſe on the cloth, and the little holes filled up, ſo that no colour can paſs through. When the cloth is dry, lay on oker in oil, which may be mixed with white-lead to make it dry the ſooner. When dry, go over it again with the pumice-

ſtone, to make it ſmooth. After this a ſecond couch is ſometimes applied, compoſed of white-lead and a little charcoal-black, to render the ground of an aſh-colour. Others prime the canvas in the following manner, they firſt ſmooth the canvas with a pumice-ſtone, ſize it over with good ſize, and a little honey, and let it ſtand to dry; after which they lay it over with whiting and ſize, mixed with a little honey: the uſe of the honey is to prevent it from cracking, peeling, and breaking out; on this they firſt draw the picture with a coal, and then lay on the colours. 2. Painting on walls: when the wall is dry, they give it two or three waſhes with boiling oil; till the plaſter remains quite greaſy, and will imbibe no more; upon this they lay drying colours, ſuch as white-chalk, red-oker, or other chalks beaten pretty ſtiff. When this couch or layer is well dried, the ſubject, or deſign is ſketched out, and afterwards painted over, mixing a little varniſh with their colours, to ſave the varniſhing afterwards. In order the better to fortify the wall againſt moiſture, ſome cover it with a plaſter of lime, marble duſt, or a cement made of beaten tiles ſoaked in linſeed-oil: and at laſt prepare a compoſition of green-pitch, maſtic, and thick varniſh boiled together, which they apply hot over the former plaſter; and when dry, lay on the colours as before. Others, in fine, make their plaſter with lime-mortar, tile-cement, and ſand; and this being dry, they apply another of lime, cement, and iron-ſcoriæ; which being well beaten, and incorporated with linſeed-oil, and whites of eggs, makes an excellent plaſter. When this is dry, the colours are laid on as before. 3. In painting on wood, they uſually give their ground a couch or layer of white tempered with ſize, and then proceed as in painting on walls. 4. In painting on ſtone or metals, it is not neceſſary to lay them over with ſize, but only to add a ſlight couch of colours before the deſign is drawn on it; nor even is this done on ſtones, where you would have the ground appear, as in certain marbles and agates of extraordinary colours.

All the colours uſed in freſco are good in oil, except white of lime and marble-duſt. Thoſe chiefly uſed are white-lead, or ceruſe, yellow and white maſticot, orpiment, vermillion, lacca, blue and green aſhes, verdigreaſe, indigo, ſmalt, black lead, ivory-black, lamp-black, &c. As to oils, the beſt are thoſe of linſeed, walnuts, ſpike, and turpentine. The drying oils or nut-oil, boiled with litharge and ſandarach, and otherwiſe with ſpirit of wine, maſtic and gum-lacca.

In the preparation of oil-colours, care muſt be taken, that they be ground fine; that in putting them on a pallet, thoſe which will not dry of themſelves be mixed with drying oil, or other ingredients of a drying quality; and that the tinged colours be mixed in as ſmall quantities as poſſible. As to the ſituation of the colours, the pureſt and ſtrongeſt muſt be placed in the front of the piece, and the colouring varied according to the ſubject, time and place. If the ſubject be grave, melancholy, or terrible, the general teint of the colouring muſt incline to brown, and black, or red and gloomy; but it muſt be gay and pleaſant in ſubjects of joy and triumph. See the article COLOURING.

For the other different methods of painting, ſee ENAMEL, FRESCO, GLASS, LIMNING, MINIATURE, &c.

PAIR, *par*, denotes two equal and ſimilar things joined together, either collectively, as a pair of gloves, or two ſimilar parts that compoſe one whole, or a ſet of things joined to make another complete, &c.

PAIR, in anatomy, an aſſemblage, or conjugation of two nerves, which have their origin together in the brain, or ſpinal marrow, and thence diſtributed into the ſeveral parts of the body, the one on one ſide, and the other on the other.

PAIS-RECONQUIS, a part of Picardy, in France, formerly in poſſeſſion of the Engliſh, but loſt in the reign of queen Mary, anno 1558.

PAITA, a town of Peru, in South America, in weſt long. 80°, ſouth lat. 5°.

PAIX, a port-town ſituated on the north ſide of the iſland of Hiſpaniola, in weſt long. 72° 30′, north lat. 20°.

PALACE, *palatium*, a name generally given to the dwelling-houſes of kings, princes, and other great perſonages; and taking different epithets, according to the quality of the inhabitants, as imperial palace, royal palace, pontifical palace, cardinal palace, ducal palace, epiſcopal palace, &c.

PALACIOS, a town of Spain, in the province of Andaluſia, ſituated fifteen miles ſouth of Seville.

PA-

PALÆSTRA, in grecian antiquity, a public building, where the youth exerciſed themſelves in wreſtling, running, playing at quoits, &c.

Some ſay the palæſtra conſiſted both of a college and an academy, the one for exerciſes of the mind, the other for thoſe of the body; but moſt authors rather take palæſtra to be a xyſtus, or mere academy for bodily exerciſes. Hence,

PALÆSTROPHYLAX was the director of the palæſtra, and the exerciſes performed therein. See the preceding article.

St. PALAIS, a town of France, in the province of Gaſcony, capital of the lower Navarre, ſituated in weſt long. 1° 8′, north lat. 43° 23′.

PALAMBOANG, or PALAMBANG, the capital of a kingdom at the eaſt end of the iſland of Java, in the Eaſt-Indies, ſituated on the ſtraits of Bally, in eaſt long. 114°, ſouth lat. 7° 30′, and ſeparated from the iſland of Bally by a narrow ſtrait.

PALAMOS, a port-town of Spain, in the province of Catalonia, ſituated on the Mediterranean, fifteen miles ſouth-eaſt of Girone.

PALANKA, a town of upper Hungary, ſituated thirty miles north of Buda.

PALANQUIN, a kind of chaiſe, or chair, borne by men on their ſhoulders, much uſed by the people of China, and the eaſt, as a vehicle for their eaſy conveyance from place to place.

PALARIA, among the Romans, a kind of exerciſe, performed at a ſtake by the ſoldiers. The ſtake being fixed in the ground, and ſix feet high above it, the young undiſciplined ſoldiers advanced againſt it, armed with a hurdle and cudgel, inſtead of a ſhield and ſword, and went through all the rules of attack and defence, as if actually engaged with an adverſary. Sometimes they ſtood at a diſtance, and attacked it with miſſive weapons, at the ſame time uſing all the requiſite motions for defending themſelves, and warding off what might be thrown againſt them.

PALATE, *palatum*, in anatomy, the fleſh that compoſes the roof, or the upper and inner part of the mouth. See the article MOUTH.

The palate has much the ſame ſtructure with the gums, but it has alſo a great number of glands, diſcovered ſo early as the time of Fallopius: theſe are principally ſituated in the hinder part near the uvula, where it is pendulous, in the manner of a curtain, which part is called the velum, or clauſtrum, of the palate. The glands ſituated particularly in this part, ſecrete a mucous fluid, ſerving to lubricate the mouth and throat, and to facilitate deglutition: they have a great number of apertures there for the diſcharge of this humour into the mouth. See the article GLAND.

The great uſes of this membrane are to defend the bones of the palate from corrupting, and for preventing by its clauſtrum or velum, the things to be ſwallowed from getting up into the noſtrils. Wounds of the palate and other parts of the mouth, are only to be healed by being anointed with honey of roſes, either alone, or mixed with balſam of Peru, or with oil of myrrh per deliquium.

Oſſa PALATI, *bones of the palate.* Theſe are two, ſituated in the poſterior part of the arch of the palate, between the pterygoide apophyſis, and the oſſa maxillaria, and running up on the ſides of the naſal foſſæ all the way to the bottom of each orbit. The figure of theſe bones is very irregular: the vomer is joined to them in the furrow of their upper ſurface. Their uſes are firſt to form the palate, the orbit, and the maxillary ſinus; ſecondly, to ſuſtain the membrane of the palate, and uvula; and thirdly, to aſſiſt in the modulation of the voice. See the articles MAXILLA, VOMER, &c.

PALATINATE, a province, or ſignory, poſſeſſed by a palatine.

PALATINATE *of Bavaria*, or, *the upper* PALATINATE, in the circle of Bavaria, in Germany, is bounded by Voightland, in the circle of upper Saxony, on the north; by Bohemia and Auſtria on the eaſt; by the river Danube, which ſeparates it from the dutchy of Bavaria, on the ſouth; and by Swabia, and part of Franconia on the weſt; being about ſeventy miles long, and forty broad.

PALATINATE *of the Rhine*, ſituated in the circle of the lower Rhine, is bounded by the archbiſhoprics of Mentz and Triers on the north; by the circles of Franconia and Swabia on the eaſt; and by Alſatia and Lorrain on the ſouth and weſt; being upwards of a hundred miles long, and about ſeventy broad.

PALATINE, or COUNT PALATINE, a title antiently given to all perſons who had any office or employment in the prince's palace; but afterwards conferred on thoſe delegated by princes to hold courts

courts of juſtice in the provinces; and on ſuch among the lords as had a palace, that is a court of juſtice, in their own houſes.

At preſent the word palatine is reſtrained to a prince of Germany, or a lord of Poland, poſſeſſed of a palatinate.

PALATINE GAMES, in roman antiquity, games inſtituted in honour of Auguſtus by his wife Livia, after he had been enrolled in the number of the gods. They were celebrated in the palace, and were continued by the ſucceeding emperors.

PALATINE TRIBES, one of the four tribes into which Rome was antiently divided by Servius Tullius.

PALATO SALPINGÆUS, called alſo muſculus tubæ novus Valſalvæ, and pterygoſtaphylinus externus, a muſcle ariſing broad and tendinous from the edge of the lunated part of the os palati; ſeveral of its fibres being ſpread on the membrane that covers the foramen narium, whence growing into a ſmall thin tendon, it is reflected about the hook-like proceſs of the inner wing of the proceſſus pterygoidæus internus, and is inſerted carnous into all the membranous, fleſhy, and cartilaginous parts of the tube, which leads from the palate to the ear. Its uſe is to dilate and keep open this tube.

PALATO-STAPHYLINUS, in anatomy, a muſcle ariſing on each ſide from the junction of the bones of the palate. It is broad at its beginning, but afterwards joins its aſſociate, and becomes then narrower, ſo as to reſemble a triangle, which deſcends from the place of its origin to the uvula, and is inſerted into its upper part: it draws it upward and forward.

PALAZULO, or PLAZZO, a town of Sicily, in the Val. de Noto, ſituated eighty miles ſouth-weſt of Meſſina.

PALAZULO, a town of Italy, in the territory of Venice, and province of Breſcia, ſituated on the river Oglio, twenty-ſix miles north-eaſt of Milan.

PALE, *palus*, a little pointed ſtake or piece of wood, uſed in making incloſures, ſeparations, &c. The pale was an inſtrument of puniſhment, and execution among the antient Romans, and ſtill continues ſo among the Turks. Hence, empaling, the paſſing a ſharp pale up the fundament through the body.

PALE, in heraldry, one of the honourable ordinaries of an eſcutcheon; being the repreſentation of a pale or ſtake placed upright, and comprehending the whole height of the coat from the top of the chief to the point. When the pale is ſingle, it is to contain one third of the breadth of the ſhield. See pl. CLXXXIX. fig. 5.

When there are ſeveral, more properly called pallets, they are proportioned ſo as that two take up two fifths of the ſhield, and three take up three-ſevenths; and in thoſe caſes the number of pieces are ſpecified, as well as that of thoſe they are charged withal, &c.

Pales are borne various ways, as wavy, crenelle, faillis, indented, ingrailed, inverted, &c. There are alſo cometed and flaming pales, which are pointed, ſometimes waved, &c.

PALE', PALED. See the article PALY.

In PALE, is applied to things borne above one another in manner of a pale.

Parti per PALE. See the article PARTI.

PALED FLOWERS, in botany, are thoſe which have their leaves ſet about, or ſurrounding, an head, or thrum, as in marigolds, &c.

PALES, or PILES, in carpentry, denote rows of ſtakes driven deep into the ground to make wooden-bridges over rivers; they ſerve to ſupport the beams laid acroſs them, from one row to another, and are ſtrongly bound with croſs pieces.

PALENCIA, or PLACENTIA, a city of Spain, in the province of Leon, ſituated on the river Cea, ſixty miles ſouth-eaſt of Leon.

PALERMO, the capital of the iſland of Sicily, ſituated on the north coaſt of that iſland, on a bay of the Mediterranean Sea: in eaſt long. 13°, north lat. 38° 30'.

PALESTINE, a part of aſiatic Turky, ſituated between thirty ſix and thirty-eight degrees of eaſt longitude, and between thirty-one and thirty-four degrees of north latitude: it is bounded by Mount Libanus, which divides it from Syria on the north; by Mount Herman, which ſeparates it from Arabia Deſerta on the eaſt; by the mountains of Seir and the Deſarts of Arabia Petræa on the ſouth; and by the Mediterranean Sea on the weſt.

It was called Paleſtine from the Philiſtines, who inhabited the ſea-coaſts. It was alſo called Judea, from Juda; and the Holy Land from our Saviour's reſidence and ſufferings in it; and it is called Canaan, and the Promiſed Land in the ſcriptures.

It

It is 150 miles in length, and 80 in breadth; and in the time of Solomon it ſeems to have extended from the Mediterranean Sea to the river Euphrates.

PALESTRINA, a city of Italy, in the pope's territory and Campania of Rome, ſituated thirty miles eaſt of Rome.

PALICAT, or PELICATE, a port-town of hither India, in Aſia, ſituated on the coaſt of Coromandel: in eaſt long. 80° north lat. 14°.

PALILIA, a feaſt among the antient Romans, in honour of the goddeſs Pales.

The Palilia were celebrated with great feſtivity by the ſhepherds on the firſt of May, to beſeech that goddeſs to take care of their flocks, and preſerve them from wolves and diſeaſes. Part of the ceremony conſiſted in burning heaps of ſtraw, and jumping over them.

PALILICIUM, in aſtronomy, the ſtar called the bull's-eye, or aldebaran. See the article ALDEBARAN.

PALIMBAM, a town on the iſland of Sumatra, in the Eaſt-Indies, ſituated in eaſt long. 103°, ſouth lat. 3°.

PALINDROMUS, παλινδρομος, a verſe or ſentence which runs the ſame when read either backwards or forwards; ſuch is the verſe,

Roma tibi ſubito montibus ibit amor.

Some people of leiſure have refined upon the palindromus, and compoſed verſes each word whereof is the ſame backwards as forwards, as that inſtance in Camden;

Odo tenet mulum, madidam mappam tenet Anna.

Anna tenet mappam madidam mulum tenet Odo.

PALING, a ſort of fencing for fruit-trees planted in fields, wherein three ſmall poſts are erected at a foot and a half diſtance one from another, and near the top nailed to each other with croſs-bars. In fixing the pales in form of a triangle, room is to be left for the tree to play and bow by the high winds, without galling: the trees are to be bound to a ſtake for a year or two, after which, fern or ſtraw may be ſtuffed in betwixt the tree and uppermoſt rails to keep it upright. If the place be open to deer, rabbits, or the like, a poſt is to be nailed to the bar between every two pales.

PALINGENESIA, among divines, ſignifies the ſame with regeneration.

Among chemiſts, it denotes the producing a body from its principles.

PALINODY, παλινωδια, a diſcourſe contrary to a preceding one: hence the phraſe *palinodiam canere* was taken for a recantation.

PALISADE, or PALISADO, in fortification, an incloſure of ſtakes or piles driven into the ground, each ſix or ſeven inches ſquare, and eight feet long, three whereof are hid under ground.

Paliſadoes are generally uſed to fortify the avenues of open ſorts, gorges, half-moons, the bottoms of ditches, the parapets of covert ways, and in general all poſt liable to ſurprize, and to which the acceſs is eaſy. Palliſadoes are uſually planted perpendicularly, though ſome make an angle inclining towards the ground next the enemy, that the ropes caſt over to tear them up may ſlip.

Turning PALISADES, are an invention of M. Coehorn, in order to preſerve the paliſades of the parapet of the covert-way from the beſiegers ſhot.

He orders them ſo, that as many of them as ſtand in the length of a rod, or in about ten feet, turn up and down like traps, ſo as not to be in ſight of the enemy till they juſt bring on their attack, and yet are always ready to do the proper ſervice of paliſades.

PALISADE, in gardening, denotes a ſort of ornament; being a row of trees which bear branches and leaves from the bottom, cut and ſpread in manner of a wall along ths ſide of an alley, or the like, ſo as to appear like a wall covered with leaves.

PALISSE', in heraldry, a bearing like a range of paliſades before a fortification, repreſented on a feſſe, riſing up a conſiderable height, and pointed a-top, with the field appearing between them. See plate CLXXXIX. fig. 6.

PALIURUS, CHRIST'S THORN, in botany, a ſpecies of rhamnus. See the article RHAMNUS.

PALL, in heraldry, denotes a kind of croſs repreſenting the pallium, or archiepiſcopal ornament ſent from Rome to the Metropolitans. See plate CXCIII. fig. 1.

PALL, *pallium*, in matters of dreſs. See the article PALLIUM.

PALLA, in roman antiquity, a mantle which women wore over the gown called ſtola. It was borne on the left ſhoulder, whence paſſing to the other ſide, under the right arm, the two ends were bound under the left arm, leaving the breaſt and arm quite bare.

PALLADIUM, in antiquity, a ſtatue of the

the goddeſs Pallas, ſuppoſed to have dropped down from heaven, preſerved in Troy, whereon the fate of that city is ſaid to have depended. It is ſaid that there was antiently a ſtatue of Pallas preſerved at Rome, in the temple of Veſta, which ſome pretended to be the true palladium of Troy, brought into Italy by Æneas; it was kept among the ſacred things of the temple, and only known to the prieſts and veſtals. It was eſteemed the deſtiny of Rome; and there were ſeveral others made perfectly like it to ſecure it from being ſtolen, as was that at Troy, which the oracle of Apollo declared ſhould never be taken ſo long as the palladium was found within its walls: this occaſioned Diomede and Ulyſſes, in the time of the trojan war, to undertake the ſtealing of it.

PALLET, among painters, a little oval table, or piece of wood, or ivory, very thin and ſmooth; on, and round which, the painters place the ſeveral colours they have occaſion for, to be ready for the pencil. The middle ſerves to mix the colours on, and to make the tints required in the work. It has no handle, but inſtead thereof, a hole at one end to put the thumb through to hold it.

PALLET, among potters, crucible makers, *&c.* a wooden inſtrument, almoſt the only one they uſe, for forming, heating, and rounding their works: they have ſeveral kinds, the largeſt are oval with a handle; others are round, or hollowed triangularly; others, in fine, are in manner of large knives, ſerving to cut off whatever is ſuperfluous on the moulds of their work.

PALLET, in gilding, an inſtrument made of a ſquirrel's tail, to take up the gold leaves from the pillow, and to apply and extend them on the matter to be gilt. See the article GILDING.

PALLET, in heraldry, is nothing but a ſmall pale, conſiſting of one half of it in breadth, and therefore there are ſometimes ſeveral of them upon one ſhield.

PALLET is alſo a part belonging to the ballance of a watch or movement. See the article WATCH.

PALLET, in ſhip-building, is a room within the hold, cloſely parted from it, in which by laying ſome pigs of lead, *&c.* a ſhip may be ſufficiently ballaſted, without loſing room in the hold; which, therefore, will ſerve for the ſtowing the more goods.

PALLIATION, or a PALLIATIVE CURE, in medicine, is when, in deſperate and incurable diſeaſes, after predicting the fatal event, the phyſician preſcribes ſome remedies for mitigating the pain, or ſome other urgent ſymptoms, as in ulcerated cancers, or cancerous fiſtulas, and the like.

Palliative indication, is where the ſymptoms of a diſeaſe give too much trouble and danger to have their cure deferred till the diſeaſe whereon they depend is removed: here the ſymptoms themſelves are to be cured or mitigated apart.

PALLIER, or PAILLIER, in building, denotes a landing-place in a ſtair-caſe. See the article STAIR-CASE.

PALLIFICATION, the ſtrengthening the foundation of any building, by driving piles into the ground. See the articles FOUNDATION and PILE.

PALLIUM, or PALL, an archiepiſcopal veſtment, of white woollen cloth, about the breadth of a border, made round, and thrown over the ſhoulders. Upon this border there are two others of the ſame matter and form, one of which falls down upon the breaſt, and the other upon the back, each having a red croſs upon it; ſeveral croſſes of the ſame colour being likewiſe upon the upper part of it, about the ſhoulders.

The pall was part of the imperial habit, and originally granted by the emperors to patriarchs; but at preſent it is given by the pope as a mark of the apoſtolic power, without which neither the function or title of archbiſhop can be aſſumed by the biſhops of his communion.

PALM, *palma*, in anatomy, the inſide of the hand, called alſo vola. See the articles HAND and PALMARIS.

PALM is alſo a meaſure of length. See the article MEASURE.

PALM-SUNDAY, in the chriſtian church, the Sunday next before Eaſter; being ſo called in memory of our Saviour's triumphal entery into Jeruſalem, when the multitude that attended him ſtrewed palm-branches in his way. See the article EASTER.

PALM-TREE, PHOENIX, in botany, *&c.* See the article PHOENIX.

PALMA, a town of Portugal, in the province of Alentejo: weſt long. 9°, north lat. 38° 30′.

PALMA is alſo a city of Terra Firma, in ſouth-America: weſt long. 74°, north lat. 4° 30′.

PALMA, or PALAMODA, a town of Italy, eight miles north of Aquileia.

PALMA

PALMA-ISLE, one of the Canary-Iſlands, ſixty miles north-weſt of Teneriff.

PALMARIS MUSCULUS, one of the flexor muſcles of the hand, ſo called as being inſerted into the palm of the hand by a broad expanded tendon: its office ſeems to be the conſtriction of the palm. There is alſo another muſcle of the hand called palmaris brevis, and quadratus, in form of a ſmall maſs of fleſh, which adheres to the aponeuroſis of the former muſcle, above the abductor muſcle of the little finger: it is ſaid to aſſiſt in drawing together the hand; but Heiſter obſerves, that both theſe muſcles are found wanting in diſſections.

PALMAS, or CAPE PALMAS, a promontory on the Guinea-coaſt: weſt long. 8°, north lat. 4° 30′.

PALMATED, ſomething reſembling the ſhape of the hand: thus we ſay palmated leaves, roots, ſtones, &c.

PALMIPEDES, among ornithologiſts, the ſame with web-footed birds. See the articles BIRD and ORNITHOLOGY.

PALMISTRY, a kind of divination, or rather a deceitful art practiſed by gypſies, who pretend to foretel events by looking upon the lines and marks of the hand: it is prohibited by ſtat. 1 and 2 Phil. & Mar. c. 4.

PALMYRA, the ruins of a magnificent city, in the province of Syria, two hundred miles ſouth-eaſt of Aleppo.

PALOS, a port-town of Spain, ſituated on the bay of Cadiz: weſt long. 7° 15′, north lat. 37°.

Cape PALOS, is a promontory of Spain, twenty miles eaſt of Carthagena.

PALOTA, a town of lower Hungary, forty miles ſouth-weſt of Buda.

PALPABLE, ſomething perceivable by the ſenſes, particularly that of feeling.

PALPEBRÆ, the EYE-LIDS, in anatomy. See the article EYE.

PALPITATION, in medicine, a ſpaſtic contraction of the heart, when it leaps and beats violently.

The heart often palpitates ſo much as to be heard at a diſtance, which may be owing to a violent motion of the body; chiefly when plethoric people aſcend high places: ſometimes it happens through fear or dread; and ſometimes from a bad conformation of the heart and the neighbouring veſſels. Sleeping in the fields, ſuppreſſion of the menſes, and the like, are likewiſe ſaid to occaſion it. Bleeding in the foot, and gentle purges, are generally the firſt ſteps towards a cure; after which, ſaline, nitrous, and cinnabarine medicines are to be uſed, particularly the antiſpaſmodic, to appeaſe the violent motions of the heart, and render the blood more fluid. The aqueous infuſions of tea, balm, veronica, primroſes, or citrons, are likewiſe proper, eſpecially with the eſſence of ſcordium, carduus benedictus, citron or orange peel, with a little dulcified ſpirit of nitre, or terra foliata tartari, taken morning and evening; as alſo temperate pediluvia, moderate but frequent exerciſe, riding, moderate diet, plenty of thin drink, whey, mineral waters, eſpecially the chalybeate kind, are all very uſeful in this diſeaſe.

PALSGRAVE, among the Germans, the ſame with palatine. See the article PALATINE.

PALSY, παραλυσις, in medicine, a diſeaſe wherein the body, or ſome of its members, loſe their motion, and ſometimes their ſenſation of feeling.

The apoplexy, ſays Dr. Mead, when not mortal, frequently terminates in a palſy, which is the criſis of the diſeaſe: this palſy generally ſeizes but one ſide of the body; and what Morgagni obſerves, after Valſalva, that, on diſſection of the bodies of apoplectics who had been ſeized with a hemiplegia, he always found the cauſe of the diſeaſe in the oppoſite ſide of the brain, the doctor ſays he has formerly found true more than once in St. Thomas's hoſpital. There is now no longer any room for blood-letting, or draſtic purges; it will be ſufficient to give warm and moderate cathartics now and then, ſuch as the tinctura ſacra. And as the diſeaſe is now become chronical, inſtead of bliſters it will be requiſite to make iſſues in proper places, eſpecially in the nape of the neck, and above the ſcapulæ, either with the actual cautery, or with cauſtic medicines. Hippocrates adviſes to apply the actual cautery in eight places, at leaſt, and ſpecifies them.

The cure is to be chiefly proſecuted with aromatic ſtrengtheners and ſteel; and beſides, it is of ſervice to ſtimulate the ſkin of the paralytic part; which is extremely well effected by the green ointment, mixed with the ſeventh or eighth part of the ſtrong ſpirit of vitriol; and, when the part begins to be rubified, the liniment is to be removed, and the part anointed with ointment of elder. Cold bathing is very beneficial in perſons not too far advanced in years; but hot

bathing is prejudicial to all paralytics; ſome of whom the doctor has known ſent to Bath by a miſtaken notion of their phyſicians, who, upon coming out of the bath, were ſeized with a return of the apoplexy, which carried them off.

Wherefore the doctor makes the following remarks on theſe waters. Their chief virtue ſeems to conſiſt in a certain mineral heat, whereby they warm and cheriſh the ſtomach and inteſtines; and, therefore, they are chiefly ſerviceable to thoſe who have ruined their appetite and digeſtive faculty by drinking wine or other ſpirituous liquors, which is well known to be the cauſe of a number of evils: but they are very prejudicial to all whoſe inward parts, as the brain, lungs, liver, or kidneys, are too hot. And, for the ſame reaſon, though they may be agreeable to, and mend, the ſtomach, yet, if the uſe of them be continued too long, they more frequently hurt this organ: that very warmth which was beneficial at firſt, by immoderate perſeverance, becoming prejudicial, by over-relaxing the fibres. A circumſtance which the doctor ſeveral times obſerved, more particularly in patients whoſe diſeaſes were owing to a fault in the nervous fluid.

This diſeaſe never is acute, is often tedious, and in old people almoſt incurable; and the patient for the moſt part drags a miſerable life. For the vigour of his mind, together with his memory are loſt, or vaſtly impaired; he totters and ſhakes, and becomes a diſmal ſight; as if no longer a man, but an animal half dead.

PALUDAMENTUM, in roman antiquity, a habit that differed in little from the chlamys, except that this laſt belonged chiefly to the lower claſs of people. See the article CHLAMYS.

However, they are promiſcuouſly uſed for each other; being the robes of ſtate proper to emperors, kings, conſuls, and generals during their triumph.

PALUMBERIUS, ACCIPITER, the goſhawk. See the article GOSHAWK.

PALUMBUS, the RINGDOVE, a beautiful ſpecies of pigeon, with the neck white on each ſide, and a brown ſpot behind. See the article COLUMBA.

PALUS MEOTIS. See MEOTIS.

PALY, or PALE', in heraldry, is when the ſhield is divided into four or more equal parts, by perpendicular lines falling from the top to the bottom. See plate CXCIII. fig. 2.

Paly-bendy is when the eſcutcheon is divided by perpendicular lines, which is paly; and alſo by diagonals, which is called bendy. See the article BENDY.

PAMIERS, a town of Languedoc, thirty miles ſouth of Toulouſe.

PAMPELUNA, the capital of ſpaniſh Navarre, is the ſee of a biſhop, and an univerſity: weſt long. 1° 30′, north lat. 43° 15′.

PAMPELUNA, is alſo a city of Terra Firma, in ſouth America: weſt long. 72°, north lat. 7°.

PAMPHYLIA, the antient name of a part of Carimania.

PAMPINIFORME CORPUS, in anatomy, a plexus, or knot, formed by the ſpermatic veins and arteries, and included in a common coat, within the teſticle. See the article TESTICLE.

PANACEA, among phyſicians, denotes an univerſal medicine, or a remedy for all diſeaſes; a thing impoſſible to be obtained, according to no leſs an author than Boerhaave.

Some alſo give the appellation panacea to certain plants, called in engliſh alheals.

PANADA, a diet conſiſting of bread boiled in water to the conſiſtence of a pulp, and ſweetened with a little ſugar. It is given to young children, and to ſick perſons, whoſe digeſtion is weak, or where ſtronger foods would be improper. It is ſometimes made thin, to ſerve as a drink.

PANAMA, the capital city of the province of Darien, in ſouth America, where the treaſures of gold and ſilver, and the other rich merchandize of Peru are lodged in magazines till they are ſent to Europe: weſt long. 82°, north lat. 9°.

PANARIA, one of the Lipari iſlands, thirty miles north of Sicily: eaſt long. 15°, north lat. 39°.

PANARIS, or PARONYCHIA, in medicine and ſurgery. See PARONYCHIA.

PANARO, a river of Italy, which riſing in the appenine mountains, on the confines of Tuſcany, divides Modena from Romania, and then running through the Ferrareſe, falls into the Gulph of Venice.

PANATHENÆA, παναθηναια, in grecian antiquity, an antient athenian feſtival, in honour of Minerva, who was the protectreſs of Athens, and called Athena. There were two ſolemnities of this name, one of which was called the greater panathenæa, and celebrated once in five years; and the other, the leſſer pana-

panathenæa, kept every third year, or, as ſome think, every year. At the celebration of the leſſer feſtival, there were three games, managed by ten preſidents elected out of the ten athenian tribes. On the evening of the firſt day was a torch race, firſt by men on foot, and next by horſemen. The ſecond contention was a gymnical exerciſe, in which the diſputants gave proofs of their ſtrength and activity. The laſt was a muſical contention: and afterwards the pyrrhic dance was performed by young boys in armour. Laſtly, they offered a coſtly ſacrifice, towards which, every one of the athenian boroughs contributed an ox. In the greater panathenæa, moſt of the ſame rites and ceremonies were practiſed, but with greater ſplendor, with the addition of ſome others, as particularly a proceſſion, in which Minerva's ſacred garment was carried; on this garment the atchievements of Minerva, *&c.* were embroidered with gold, by a ſelect number of young virgins.

PANAX, GINSENG, in botany, a genus of the pentandria-digynia claſs of plants, the general corolla of which is uniform; the partial corolla conſiſts of five, oblong, crooked, equal petals: the fruit is a roundiſh berry, having one cell, and is coronated with the cup: the ſeeds are two, and of a kidney-like ſhape.

The numerous virtues of this plant have been already given under GINSENG.

PANAY, the capital of the iſle of Panay, one of the Philippine iſlands; eaſt long. 119°, and north lat. 11°.

PANCARPUS, in roman antiquity, a kind of ſhew which the roman emperors frequently exhibited to the people. In this ſpectacle, the circus being ſet all over with large trees, repreſented a foreſt, into which the beaſts being let from the dens under the ground, the people, at a ſign given by the emperor, purſued, ſhot, cut in pieces, and killed all they could lay hold of, which they afterwards carried away, to regale upon at home. The beaſts uſually given on theſe occaſions were boars, deer, oxen, and ſheep.

PANCH, or PAUNCH. See PAUNCH.

PANCHREAS, or PANCREAS. See the article PANCREAS.

PANCHREST, in medicine, the ſame with panacea. See PANACEA.

PANCHYMAGOGUE, in pharmacy, a name given to ſome cathartic extracts, that have the reputation of purging off all kinds of humours. The moſt celebrated of which, are that of Crollius, and that of Hartman. Crollius's panchymagogue is an extract of the pulp of coloquintida, of pulvis diarrhodon abbatis, agaric, and black hellebore. That of Hartman is an extract made from ſena-leaves, rhubarb, black-hellebore-root, white reſinous turpeth, polypody of the oak, trochiſci, alhandal, troches of agaric, and aloes.

PANCRATIUM, παγκράτιον, among the antients, a kind of exerciſe, which conſiſted of wreſtling and boxing. In theſe conteſts it was cuſtomary for the weaker party, when he found himſelf preſſed by his adverſary, to fall down, and fight rolling on the ground.

This was the third gymnaſtic exerciſe, and was not introduced till long after the others.

Thoſe who engaged in theſe exerciſes were called pancratiaſtæ; which name was alſo given to ſuch as did not confine themſelves to one exerciſe, but ſucceeded in ſeveral different ones.

PANCRATIUM, SEA DAFFODIL, in botany, a genus of the hexandria-monogynia claſs of plants, the flower of which conſiſts of ſix lanceolated petals, and its nectarium is a ſingle, tubular infundibuliform petal; the fruit is a roundiſh triquetrous capſule, formed of three valves, and containing three cells, with numerous globoſe ſeeds.

PANCREAS, in anatomy, popularly called the ſweet-bread, is a large gland, of a flattiſh ſhape and fleſhy colour, extended behind the ſtomach, and reaching from the duodenum tranſverſely towards the ſpleen. Its length is eight or nine inches; its breadth about two fingers, or two and a half; its thickneſs about one finger; and its weight about three ounces. In man, the ſhape of the pancreas very much reſembles the tongue of a dog; it is broadeſt towards the duodenum, and gradually narrower towards the ſpleen. Its ſubſtance is glandulous, and it ſeems formed by a conglomeration of many glands. It is ſurrounded with a membrane, which is continuous with the peritonæum: it has arteries from the cœliac and ramus ſplenicus; and veins alſo from the ſplenic vein; its nerves are from the par vagum and the intercoſtals; and finally it has an excretory duct, which is ſituated in the middle of the pancreas, where it reſembles an empty vein, and is about the thickneſs of a ſmall ſtraw. This duct terminates in the duo-

denum, which it enters obliquely, four or five fingers breadth below the pylorus, uſually at the ſame orifice with the ductus cholidocus; but ſometimes it has a double aperture.

The uſe of the pancreas is to ſecrete a peculiar liquor, called the pancreatic juice, which is of a ſalivoſe nature, and is carried by the pancreatic duct into the duodenum, where it ſerves to dilute the chyle, to render it more fluid, and fit to enter the mouths of the lacteals; and, perhaps, to temper and dilute the bile, to change its viſcidity, bitterneſs, colour, &c. and make it mix with the chyle, in order to reduce the ſeveral taſtes, odours, and properties of the ſeveral foods, into one homogeneous one. See the articles CHYLE and BILE.

PANDECTS, in the civil law, collections made by Juſtinian's order, of five hundred and thirty four deciſions of the antient lawyers, on ſo many queſtions occurring in the civil law; to which that emperor gave the force and authority of law, by an epiſtle prefixed to them. The pandects conſiſt of fifty books, and make the firſt part of the body of the civil law. See the article CIVIL LAW.

PANDICULATION, a ſtretching, or that violent and tenſive motion of the ſolids, which uſually accompanies the act of yawning.

PANDORON, in antiquity, a muſical inſtrument, reſembling a lute, but with ſtrings of braſs; its frets were of copper, and its back flat, like the guitar. See the articles LUTE and GUITAR.

PANEGYRIC, an oration in praiſe of ſome extraordinary thing, perſon, or virtue.

Panegyrics were antiently made in the public and ſolemn aſſemblies of the Greeks, either at their games, their feaſts, or religious meetings. To render them the more ſolemn, they uſed to begin with the praiſes of the deity, in whoſe honour the games, &c. were celebrated; then they deſcended to the praiſes of the people or country where they were celebrated; then to the princes or magiſtrates who preſided at them; and at length to the champions, eſpecially thoſe who had gained the prize.

Panegyric is ranked among the demonſtrative kinds of orations, whereof there are commonly reckoned two kinds, *viz.* the artificial, where every thing is reduced to certain heads; and the other natural, where the order of hiſtory is obſerved.

PANEGYRICUM, in church-hiſtory, an eccleſiaſtical book, uſed by the greek church, containing the panegyrical orations of various authors, on the ſolemnities of Jeſus Chriſt and the ſaints.

Among the principal authors of this work are St. Athanaſius, Cyrill, Baſil, Chryſoſtom, &c.

PANEL, in law, ſignifies a ſchedule, or ſmall roll of parchment, in which is contained the names of the jurors returned by the ſheriff, to paſs upon trial; ſo that the impanelling of a jury is no more than the ſheriff's entering them upon his panel or roll.

PANEL, or PANNEL, in joinery. See the article PANNEL.

PANGONIA, in natural hiſtory, the name of a genus of cryſtal, conſiſting of ſuch as are compoſed of many angles. See the article CRYSTAL.

The bodies of this genus are ſingle-pointed, or imperfect cryſtals, compoſed of dodecangular or twelve-planed columns, terminated by twelve-planed pyramids, and the whole body, therefore, made up of twenty-four planes. Of this genus there are only three known ſpecies. 1. A browniſh-white one, with a long pyramid. This is found in Sileſia and Bohemia; ſometimes in mountains, and ſometimes on the ſides of rivers, and is eſteemed a very valuable cryſtal. 2. A yellowiſh-brown one, with a ſhort pyramid. This is often brought over to us under the name of ſaxon topaz, among the other cryſtals commonly known by that name. And, 3. A clear colourleſs one, with a very ſhort pyramid. This is a very valuable cryſtal, and is produced in the Eaſt-Indies, being often brought over among the indian ballaſt.

PANIC, denotes an ill-grounded terror or fright.

Polyænus fetches the origin of the phraſe from Pan, one of the captains of Bacchus, who, with a few men, put a numerous army to rout, by a noiſe which his ſoldiers raiſed in a rocky valley favoured with a great number of echoes; for this ſtratagem making their numbers appear much greater than it really was, the enemy quitted a very commodious encampment, and fled. Hence, ſays our author, all ill-grounded fears have been called panics, or panic fears.

PANICLE, in botany, denotes a ſoft woolly beard, on which the ſeeds of ſome plants, as millet, reeds, &c. hang.

PANICUM, PANIC, in botany, a genus of

of the triandria-digynia claſs of plants, the flower of which is compoſed of two ſharp-pointed valves, and incloſes the ſeed, which is ſingle and roundiſh, but ſomewhat flatted.

Panic-ſeed is accounted drying, refrigerant, and aſtringent; and therefore recommended in ſpitting of blood, and nocturnal pollutions.

PANNAGE, *pannagium*, in law-books, ſignifies the food that ſwine feed upon in woods, as maſt of beech and acorns; or money taken by the king's agiſtors for the privilege of feeding hogs in the king's foreſt.

PANNEL, or PANEL, in law. See the article PANEL.

In the ſcotch law, pannel ſignifies the priſoner at the bar, or perſon who takes his trial before the court of juſticiary, for ſome crime.

PANNEL, in joinery, is a tympanum, or ſquare piece of thin wood, ſometimes carved, framed, or grooved in a larger piece, between two upright pieces and two croſs-pieces.

PANNEL, in maſonry, is one of the faces of a hewn ſtone.

PANNELS *of a ſaddle*, are two cuſhions or bolſters, filled with cow's, deer's, or horſe-hair, and placed under the ſaddle, on each ſide, to prevent the bows and bands from galling the horſe.

PANNICULUS CARNOSUS, in comparative anatomy, a robuſt fleſhy tunic, ſituated in beaſts, between the tunic and the fat; by means of which they can move their ſkin in whole or part: it is altogether wanting in mankind.

PANNIER, CORBEIL, or BASKET, in fortification. See BASKET.

PANNUS, in medicine, the ſame with the unguis of the eye. See UNGUIS.

PANORPA, the SCORPION-FLY, in zoology, a genus of inſects, with membranaceous wings, the roſtrum or trunk whereof is cylindric and of a horny ſtructure, and there is a weapon of the cheliform kind at the tail; the antennæ are ſetaceous, black, and compoſed of no leſs than thirty articulations; the back is brown; the ſides are yellow; and the wings are white.

PANSWICK, a market-town, ſix miles ſouth of Gloceſter.

PANTALOON, a ſort of garment, conſiſting of breeches and ſtockings all of one piece; ſaid to have been firſt introduced by the Venetians.

In a theatrical ſenſe, pantaloon denotes a buffoon, who performs groteſque dances; and hence is uſed, by ſome, for the habit or dreſs worn by ſuch perſons.

PANTHEA, in antiquity, ſtatues compoſed of the figures or ſymbols of ſeveral divinities.

PANTHEON, in roman antiquity, a temple of a circular form, dedicated to all the gods: it was built by Agrippa, ſon-in-law to Auguſtus; but is now converted into a church, and dedicated to the Virgin and all the martyrs.

PANTHER, *panthera*, in zoology, the female leopard. See LEOPARD.

PANTOMIME, in antiquity, a perſon who imitates all ſorts of actions and characters, by mere geſtures, without ſpeaking a word.

PANTON-SHOE. See HORSE-SHOE.

PANUCO, a city of Mexico, ſituated at the mouth of a river of the ſame name, which falls into the gulph of Mexico: weſt longitude 103°, and north latitude 23°.

PAPA, a town of lower Hungary, ſubject to the empreſs-queen: eaſt long. 18°, and north lat. 47° 40′.

PAPAL CROWN. See CROWN.

PAPAVER, the POPPY, in botany. See the article POPPY.

PAPAYA, or CARICA, in botany. See the article CARICA.

PAPENHEIM, a town of Franconia, in Germany, ſubject to its own count: eaſt long. 11°, north lat. 48° 55′.

PAPER, *χαρτος*, ſheets of a thin matter, made of ſome vegetable ſubſtance.

The materials on which mankind have, in different ages, contrived to write their ſentiments, have been extremely various; in the early ages they made uſe of ſtones, and tables of wood, wax, ivory, &c. See the article BOOK.

Paper, with regard to the manner of making it, and the materials employed therein, is reducible to ſeveral kinds; as egyptian paper, made of theruſh papyrus; bark-paper, made of the inner rind of ſeveral trees; cotton paper; incombuſtible paper; and european paper, made of linen-rags.

Egyptian paper was principally uſed among the antients; being made of the papyrus or biblus, a ſpecies of ruſh, which grew on the banks of the Nile: in making it into paper, they began with lopping off the two extremes of the plant, the head and the root; the remaining part, which

was

was the ſtem, they cut lengthwiſe into two nearly equal parts, and from each of theſe they ſtripped the ſcaly pellicles of which it conſiſted. The innermoſt of theſe pellicles were looked on as the beſt, and that neareſt the rind as the worſt: they were therefore kept apart, and made to conſtitute two different ſorts of paper. As the pellicles were taken off, they extended them on a table, laying them over each other tranſverſely, ſo as that the fibres made right angles; in this ſtate they were glued together by the muddy waters of the Nile; or, when thoſe were not to be had, with paſte made of the fineſt wheat-flour, mixed with hot water and a ſprinkling of vinegar. The pellicles were next preſſed, to get out the water, then dried, and laſtly flatted and ſmoothed by beating them with a mallet: this was the egyptian paper, which was ſometimes farther poliſhed by rubbing it with a glaſs-ball, or the like.

Bark-paper was only the inner whitiſh rind, incloſed between the bark and the wood of ſeveral trees, as the maple, plane, beech, and elm, but eſpecially the tilia, or linden-tree, which was that moſtly uſed for this porpoſe. On this, ſtripped off, flatted, and dried, the antients wrote books, ſeveral of which are ſaid to be ſtill extant.

Chineſe paper is of various kinds; ſome is made of the rinds or barks of trees, eſpecially the mulberry-tree and elm, but chiefly of the bambu and cotton-tree. In fact, almoſt each province has its ſeveral paper. The preparations of paper made of the barks of trees, may be inſtanced in that of the bambu, which is a tree of the cane or reed kind. The ſecond ſkin of the bark, which is ſoft and white, is ordinarily made uſe of for paper: this is beat in fair water to a pulp, which they take up in large moulds, ſo that ſome ſheets are above twelve feet in length: they are completed, by dipping them, ſheet by ſheet, in alum-water, which ſerves inſtead of the ſize among us, and not only hinders the paper from imbibing the ink, but makes it look as if varniſhed over. This paper is white, ſoft, and cloſe, without the leaſt roughneſs; tho' it cracks more eaſily than european paper, is very ſubject to be eaten by the worms, and its thinneſs makes it liable to be ſoon worn out.

Cotton-paper is a ſort of paper which has been in uſe upwards of ſix hundred years. In the french king's library are manuſcripts on this paper, which appear to be of the Xth century; and from the XIIth century, cotton manuſcripts are more frequent than parchment ones. Cotton-paper is ſtill made in the Eaſt-Indies, by beating cotton-rags to a pulp.

Linen or european paper appears to have been firſt introduced among us towards the beginning of the XIVth century; but by whom this valuable commodity was invented, is not known. The method of making paper of linen or hempen-rags, is as follows: the linen-rags being carried to the mill, are firſt ſorted; then waſhed very clean in puncheons, whoſe ſides are grated with ſtrong wires, and the bottoms bored full of holes. After this they are fermented, by laying them in heaps cloſe covered with ſacking, till they ſweat and rot; which is commonly done in four or five days. When duly fermented, they are twiſted into handfuls, cut ſmall, and thrown into oval mortars, made of well-ſeaſoned oak, about half a yard deep, with an iron-plate at bottom, an inch thick, eight inches broad, and thirty long: in the middle is a waſhing-block, grooved, with five holes in it, and a piece of hair-ſieve faſtened on the inſide: this keeps the hammers from touching it, and prevents any thing going out except the foul water. Theſe mortars are continually ſupplied with water, by little troughs, from a ciſtern, fed by buckets fixed to the ſeveral floats of a great wheel, which raiſes the wooden hammers, for pounding the rags in the mortars. When the rags are beaten to a certain degree, called the firſt ſtuff, the pulp is removed into boxes, made like corn-chandlers bins, with the bottom-board aſlant, and a little ſeparation on the front, for the water to drain away. The pulp of the rags being in, they take away as many of the front-boards as are needful, and preſs the maſs down hard with their hands: the next day they put on another board, and add more pulp, till the box is full; and here it remains mellowing a week, more or leſs, according to the weather. After this, the ſtuff is again put into clean mortars, and is beaten afreſh, and removed into boxes, as before; in which ſtate it is called the ſecond ſtuff. The maſs is beat a third time, till ſome of it being mixed with fair water, and brewed to and fro, appears like flour and water, without any lumps

lumps in it; it is then fit for the pit-mortar, where it is perfectly diſſolved, and is then carried to the vat, to be formed into ſheets of paper. But lately, inſtead of pounding the rags to a pulp with large hammers, as above, they make uſe of an engine, which performs the work in much leſs time. This engine conſiſts of a round ſolid piece of wood, into which are faſtened ſeveral long pieces of ſteel, ground very ſharp. This is placed in a large trough with the rags, and a ſufficient quantity of water. At the bottom of the trough is a plate with ſteel bars, ground ſharp like the former; and the engine being carried round with prodigious velocity, reduces the rags to a pulp in a very ſhort time. It muſt be obſerved, that the motion of the engine cauſes the water in the trough to circulate, and by that means conſtantly returns the ſtuff to the engine. The trough is conſtantly fed with clean water at one end, while the dirty water from the rags is carried off at the other, thro' a hole, defended with wire-gratings, in order to hinder the pulp from going off with the dirty water.

When the ſtuff is ſufficiently prepared as above, it is carried to the vat, and mixed with a proper quantity of water, which they call priming the vat. The vat is rightly primed, when the liquor has ſuch a proportion of the pulp, as that the mould, on being dipped into it, will juſt take up enough to make a ſheet of paper of the thickneſs required. The mould is a kind of ſieve, exactly of the ſize of the paper to be made, and about an inch deep, the bottom being formed of fine braſs-wire, guarded underneath with ſticks, to prevent its bagging down, and to keep it horizontal; and further, to ſtrengthen the bottom, there are large wires placed in parallel lines, at equal diſtances, which form thoſe lines viſible in all white paper, when held up to the light: the mark of the paper is alſo made in this bottom, by interweaving a large wire in any particular form. This mould the maker dips into the liquor, and gives it a ſhake as he takes it out, to clear the water from the pulp. He then ſlides it along a groove to the coucher, who turns out the ſheet upon a felt, laid on a plank, and lays another felt on it; and returns the mould to the maker, who by this time has prepared a ſecond ſheet, in another mould: and thus they proceed, laying alternately a ſheet and a felt, till they have made ſix quires of paper, which is called a poſt; and this they do with ſuch ſwiftneſs, that, in many ſorts of paper, two men make twenty poſts, or more, in a day. A poſt of paper being made, either the maker or coucher whiſtles; on which four or five men advance, one of whom draws it under the preſs, and the reſt preſs it with great force, till all the water is ſqueezed from it; after which it is ſeparated, ſheet by ſheet from the felts, and laid regularly one ſheet upon another; and having undergone a ſecond preſſing, it is hung up to dry. When ſufficiently dried, it is taken off the lines, rubbed ſmooth with the hands, and laid by till ſized, which is the next operation. For this they chooſe a fine temperate day, and having boiled a proper quantity of clean parchment or vellum-ſhavings, in water, till it comes to a ſize; they prepare a fine cloth, on which they ſtrew a due proportion of white vitriol and roch-alum, finely powdered, and ſtrain the ſize through it, into a large tub; in which they dip as much paper at once as they can conveniently hold, and with a quick motion give every ſheet its ſhare of the ſize, which muſt be as hot as the hand can well bear it. After this, the paper is preſſed, hung up ſheet by ſheet to dry; and being taken down, is ſorted, and what is only fit for outſide-quires, laid by themſelves: it is then told into quires, which are folded and preſſed. The broken ſheets are commonly put together, and two of the worſt quires are placed on the outſide of every ream or bundle; and being tied up in wrappers, made of the ſettling of the vat, it is fit for ſale.

Paper is of various kinds, and uſed for various purpoſes: with regard to colour, it is principally diſtinguiſhed into white, blue, and brown; and with regard to its dimenſions, into atlas, elephant, imperial, ſuper-royal, royal, medium, demy, crown, fool's cap, and pot paper.

As engliſh paper is, in general, as good as any we receive from abroad, a very high duty is laid on the importation of all foreign paper, which is more or leſs, according to the ſize, the value, and the country from whence it is brought; thus royal atlas fine, and fine imperial paper, pay 1l. 9s. 8¾d. the ream; fine genoa and dutch royal pay 17s. 8¾d. the ream; genoa and german crown and fool's cap paper pay about 2s. 7d. and genoa

pot

pot pays 2s. 2½d. and for every 20s. value, according to the book of rates, of paper brought from Rochelle, 6s. No drawback is allowed on foreign paper exported.

Blotting PAPER, is paper not ſized, and into which ink readily ſinks: it is uſed in books, &c. inſtead of ſand, to prevent blotting; and alſo by apothecaries for filtring.

Teint, or *Demi-teint*-PAPER, is a paper uſed for deſigning on, and is either blue, brown, or biſtered.

Biſtered PAPER, is white paper waſhed over with a ſponge dipped in ſoot-water. Its uſe is to ſave the labour of the crayon in places which are to be ſhadowed the ſame depth as the teint of this paper: as to the light places, they are made with chalk.

Marbled PAPER. See MARBLING.

PAPER-OFFICE, an office in the palace of Whitehall, in which all the public writings, matters of ſtate and council, proclamations, letters, intelligences, negotiations abroad, and generally all diſpatches that paſs through the offices of the ſecretaries of ſtate, are lodged, by way of library.

PAPER-OFFICE is alſo an office belonging to the court of king's bench. See the article KING'S BENCH.

PAPHLAGONIA, an antient province of the leſſer Aſia, ſituated on the Euxine-ſea, now part of the province of Amaſia, in Turky.

PAPHOS, once an elegant city at the weſt end of the iſland of Cyprus; but the little town of Baffo is now all that remains of it.

PAPILIO, the BUTTERFLY, in zoology, a numerous genus of four-winged inſects, of the lepidoptera order, diſtinguiſhed by clavated antennæ.

The butterflies are ſo numerous, that authors commonly divide them into claſſes or ſubdiviſions, according to the number of their legs, ſome having ſix, and others only four legs, under each of which are comprehended a multitude of beautiful ſpecies, diſtinguiſhed by the different colours and variegations of their wings.

PAPILIONACEOUS, among botaniſts, an appellation given to the flowers of certain plants, from their reſembling the figure of a butterfly: they conſiſt of four petals, whereof that which covers the others, is called the vexillum; the two petals placed on each ſide, are called the alæ or the wings; and the loweſt petal is termed the carina, which is often divided into two portions. See plate XXXI. n° 10. and 22.

PAPILLA, the NIPPLE OF THE BREAST, in anatomy. See BREAST.

There are alſo papillæ of the ſkin and tongue. See CUTIS and TONGUE.

PAPIO, in zoology, the name uſed by ſome authors for thoſe monkeys, called in engliſh baboons. See MONKEY and BABOON.

PAPOUL, or ST. PAPOUL, a town of France, in the province of Languedoc, thirty-two miles ſouth-eaſt of Toulouſe.

PAPOUS, or NEW GUINEA, a large continent in the Pacific-ocean, a little ſouth of the equator; ſituated eaſt of the Spice-iſlands, in 130° eaſt long. but how far it extends farther to the eaſtward or ſouthward, is uncertain.

PAPPUS, in botany, a ſoft downy ſubſtance that grows on the ſeeds of certain plants, as thiſtles, hawkweed, &c. ſerving to ſcatter and buoy them up in the air.

PAPULÆ, a name uſed, by ſeveral authors, for eruptions on the ſkin of any ſort.

PAR, in commerce, ſignifies any two things equal in value; and in money-affairs, it is ſo much as a perſon muſt give of one kind of ſpecie, to render it juſt equivalent to a certain quantity of another.

In the exchange of money with foreign countries, the perſon to whom a bill is payable, is ſuppoſed to receive the ſame value as was paid the drawer by the remitter; but this is not always the caſe, with reſpect to the intrinſic value of the coins of different countries, which is owing to the fluctuation in the prices of exchange amongſt the ſeveral european countries, and the great trading cities. The par, therefore, differs from the courſe of exchange in this, that the par of exchange ſhews what other nations ſhould allow in exchange, which is rendered certain and fixed, by the intrinſic value of the ſeveral ſpecies to be exchanged: but the courſe ſhews what they will allow in exchange; which is uncertain and contingent, ſometimes more, and ſometimes leſs; and hence the exchange is ſometimes above, and ſometimes under par. See EXCHANGE.

PAR, in anatomy, a pair of the nerves. See the article NERVES.

PARABLE, a fable, or allegorical inſtruction, founded on ſomething real or apparent in nature or hiſtory, from which a moral is drawn, by comparing it with ſome-

PARABOLA

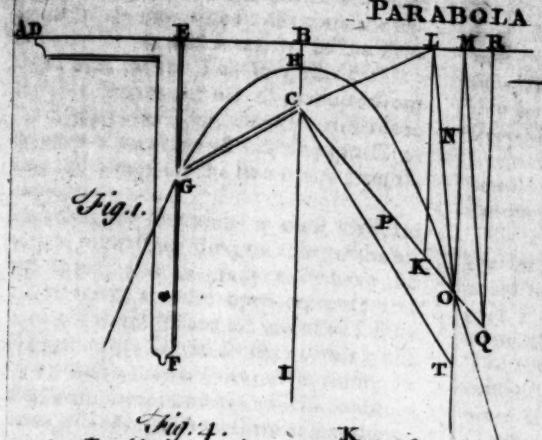


Fig. 1.

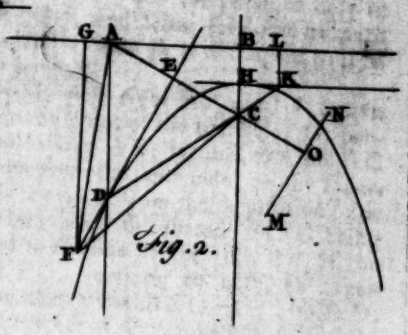


Fig. 2.

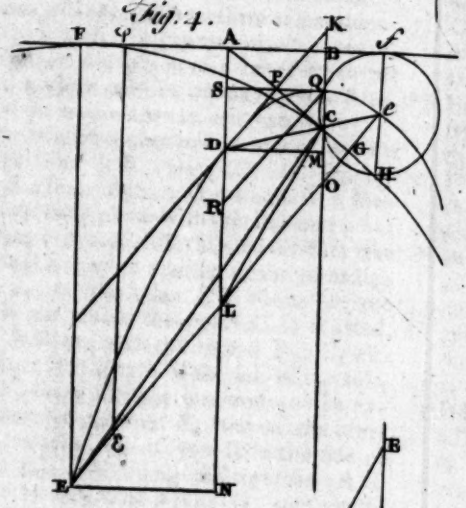


Fig. 4.

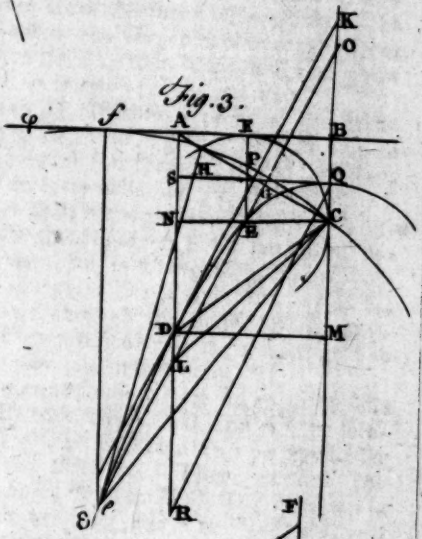


Fig. 3.

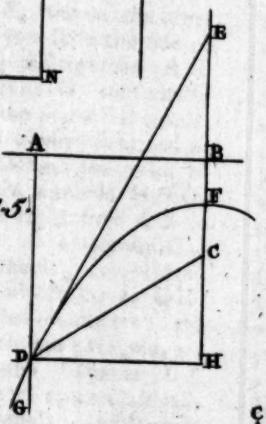


Fig. 5.

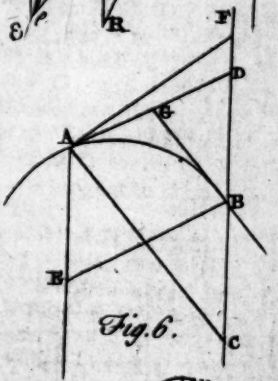


Fig. 6.

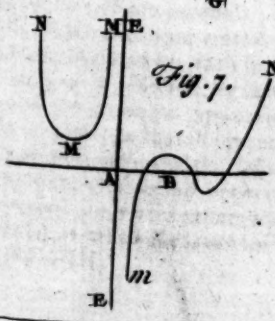


Fig. 7.

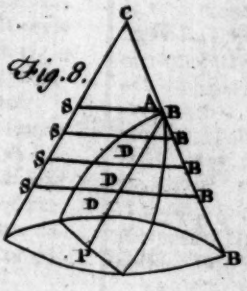


Fig. 8.

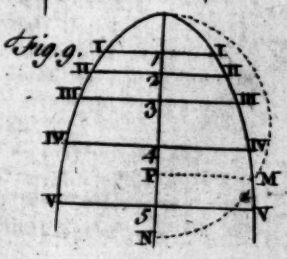


Fig. 9.

BRITISH MUSEUM

ſomething in which the people are more immediately concerned: ſuch are the parables of Dives and Lazarus, of the Prodigal Son, of the Ten Virgins, &c. Kircher derives the uſe of parables from the Egyptians. Some make a difference between a parable and a fable; but Grotius and others uſe the two terms promiſcuouſly.

Parables are certainly a moſt delicate way of impreſſing diſagreeable truths on the mind, and in many caſes have the advantage of a more open reproof, and even of formal leſſons of morality: thus Nathan made David ſenſible of his guilt by a parable; and thus our Saviour, in attacking the prejudices of his countrymen, always ſpoke to them in parables.

PARABOLA, in geometry, a figure ariſing from the ſection of a cone, when cut by a plane parallel to one of its ſides. See the article CONIC SECTIONS.

To deſcribe a parabola in plano, draw a right line AB (plate CXCII. fig. 1.) and aſſume a point C without it; then in the ſame plane with this line and point place a ſquare rule DEF, ſo that the ſide DE may be applied to the right line AB, and the other EF turned to the ſide on which the point C is ſituated. This done, and the thread FGC, exactly of the length of the ſide of the rule, EF, being fixed at one end to the extremity of the rule F, and at the other to the point C, if you ſlide the ſide of the rule DE along the right line AB, and by means of a pin, G, continually apply the thread to the ſide of the rule, EF, ſo as to keep it always ſtretched as the rule is moved along, the point of this pin will deſcribe a parabola GHO.

Definitions. 1. The right line AB is called the directrix. 2. The point C is the focus of the parabola. 3. All perpendiculars to the directrix, as LK, MO, &c. are called diameters; the points, where theſe cut the parabola, are called its vertices; the diameter BI, which paſſes through the focus C, is called the axis of the parabola; and its vertex, H, the principal vertex. 4. A right line, terminated on each ſide by the parabola, and biſſected by a diameter, is called the ordinate applicate, or ſimply the ordinate, to that diameter. 5. A line equal to four times the ſegment of any diameter, intercepted between the directrix and the vertex where it cuts the parabola, is called the latus rectum, or parameter of that diameter. 6. A right line which touches the parabola only in one point, and being produced on each ſide falls without it, is a tangent to it in that point.

Prop. I. Any right line, as GE, drawn from any point of the parabola, G, perpendicular to AB, is equal to a line GC drawn from the ſame point to the focus. This is evident from the deſcription; for the length of the thread FGC being equal to the ſide of the rule EF, if the part FG, common to both, be taken away, there remains EG=GC. Q.E.D.

The reverſe of this propoſition is equally evident, *viz.* that if the diſtance of any point from the focus of a parabola, be equal to the perpendicular drawn from it to the directrix, then ſhall that point fall in the curve of the parabola.

Prop. II. If from a point of the parabola, D, (*ibid.* fig. 2.) a right line be drawn to the focus, C; and another, DA, perpendicular to the directrix; then ſhall the right line DE, which biſſects the angle, ADC, contained between them, be a tangent to the parabola in the point D: a line alſo, as HK, drawn through the vertex of the axis, and perpendicular to it, is a tangent to the parabola in that point.

1. Let any point F be taken in the line DE, and let FA, FC, and AC be joined; alſo let FG be drawn perpendicular to the directrix. Then, becauſe (by prop. I.) DA=DC, DF common to both, and the $\angle$FDA=FDC, FC will be equal to FA; but FA$>$FG, therefore FC$>$FG, and conſequently the point F falls without the parabola: and as the ſame can be demonſtrated of every other point of DE, except D, it follows that DE is a tangent to the parabola in D. Q.E.D.

2. If every point of HK, except H, falls without the parabola, then is HK a tangent in H. To demonſtrate this, from any point K draw KL $\perp$ AB, and join KC; then becauſe KC$>$CH=HB=KL, it follows that KC$>$KL, and conſequently that the point K falls without the parabola: and as this holds of every other point, except H, it follows that KH is a tangent to the parabola in H. Q.E.D.

Prop. III. Every right line, parallel to a tangent, and terminated on each ſide by the parabola, is biſſected by the diameter paſſing thro' the point of contact; that is,

it will be an ordinate to that diameter. For let E *e* (*ibid.* fig. 3 and 4.) terminating in the parabola in the points E, *e*, be parallel to the tangent DK; and let AD be a diameter paſſing through the point of contact D, and meeting E*e* in L; then ſhall EL = L*e*.

Let AD meet the directrix in A, and from the points E, *e*, let perpendiculars EF, *ef*, be drawn to the directrix; let CA be drawn, meeting E*e* in G; and on the center E, with the diſtance EC, let a circle be deſcribed, meeting AC again in H, and touching the directrix in F; and let DC be joined. Then becauſe DA = DC, and ∠ ADK = ∠ CDK, it follows (4. 1.) that DK ⊥ AC; wherefore E*e* ⊥ AC, and CG = GH (3. 3.); ſo that *e*C = *e*H (4. 1.) and a circle deſcribed upon the center *e*, with the radius *e*C, muſt paſs through H; and becauſe *e*C = *ef*, it muſt likewiſe paſs through *f*. Now becauſe F*f* is a tangent to both theſe circles, and AHC cuts them, □ AF = □ CAH (36. 3.) = □ A*f*; therefore AF = A*f*, and FE, AL, and *f e* are parallel; and conſequently LE = L*e*. Q. E. D.

Prop. IV. If from any point of a parabola, D (*ibid.* fig. 5.) a perpendicular, DH, be drawn to a diameter BH, ſo as to be an ordinate to it; then ſhall the ſquare of the perpendicular, DH², be equal to the rectangle contained under the abſciſs HF, and the parameter of the axis, or to four times the rectangle HFB.

1. When the diameter is the axis; let DH ⊥ BC, join DC, and draw DA ⊥ AB, and let F be the vertex of the axis. Then, becauſe HB = DA = DC, it follows that HB² = DC² = DH² + HC². Likewiſe, becauſe BF = FC, HB² = 4 □ HFC + HC² (by 8. 2.). Wherefore DH² + HC² = 4 □ HFB + HC²; and DH² = 4 □ HFB; that is, DH² = the rectangle contained under the abſciſs HF, and the parameter of the axis.

2. When the diameter is not the axis: let EN (*ibid.* fig. 3 and 4.) be drawn perpendicular to the diameter AD, and EL an ordinate to it; and let D be the vertex of the diameter.

Then ſhall EN² = to the rectangle contained under the abſciſs LD, and the parameter of the axis. For let DK be drawn parallel to LE, and conſequently a tangent to the parabola in the point D; and let it meet the axis in K: let EF ⊥ AB the directrix; and on the center E, with the radius EF, deſcribe a circle, which will touch the directrix in F, and paſs through the focus C: then join AC, which will meet the circle again in H, and the right lines DK, LE, in the points P, G; and, finally, let LE meet the axis in O.

Now ſince the angles CPK, CBA are right, and the angle BCP common, the triangles CBA, CPK are equiangular; and AC : CB (or CK : CP) :: OK : GP; and AC × GP = OK × CB. Again, becauſe CA = 2CP, and CH = 2CG, AH = 2GP; and conſequently the □ CAH = CA × 2GP = OK × 2CB. But, EN² = FA² = □ CAH; and conſequently, EN² = OK × 2CB = the □ contained under the abſciſs, LD, and the parameter of the axis. Q. E. D.

Hence, 1. The ſquares of the perpendiculars, drawn from any points of the parabola to any diameters, are to one another as the abſciſſæ intercepted between the vertices of the diameters and the ordinates applied to them from the ſame points.

2. The ſquares of the ordinates, applied to the ſame diameter, are to each other as the abſciſſæ between each of them and the vertex of the diameter. For let EL, QR (*ibid.* fig. 3. 4.) be ordinates to the ſame diameter DN; and let EN, QS be perpendiculars to it. Then, on account of the equiangular triangles ELN, QRS, EL² : QR² :: EN² : QS²; that is, as the abſciſs DL to the abſciſs DR.

Prop. V. If from any point of a parabola E (*ibid.* fig. 3 and 4.) an ordinate EL be applied to the diameter AD; then ſhall the ſquare of EL be equal to the rectangle contained under the abſciſs DL, and the latus rectum or parameter of that diameter.

For, ſince QR = DK, QR² will be equal to DM² + MK²; but (by caſe 1. of prop. 4.) DM² = 4 □ MQB; and becauſe MQ = QK, MK² = 4MQ²; wherefore QR² = 4 □ MQB + 4MQ²; that is, to 4 □ QMB. But MQ = QK = DR, and MB = DA; wherefore QR² = 4 □ RDA: and becauſe QR, EL are ordinates to the diameter AD, QR² (by cor. 2. of prop. 4.) : EL² (:: RD : LD) :: 4 □ KDA : 4 □ LDA. Therefore EL² = 4 □ LDA, or the rectangle contained under the abſciſs LD, and

and the parameter of the diameter AD: and from this property, Apollonius called the curve a parabola. Q. E. D.

Prop. VI. If from any point of a parabola, A (*ibid.* fig. 6.) there be drawn an ordinate, AC, to the diameter BC; and a tangent to the parabola in A, meeting the diameter in D: then shall the segment of the diameter, CD, intercepted between the ordinate and the tangent, be bisected in the vertex of the diameter B. For let BE be drawn parallel to AD, it will be an ordinate to the diameter AE; and the abscisis BC will be equal to the abscisis AE, or BD. Q. E. D.

Hence, if AC be an ordinate to BC, and AD be drawn so as to make BD = DC, then is AD a tangent to the parabola. Also the segment of the tangent, AD, intercepted between the diameter and point of contact, is bisected by a tangent BG, passing through the vertex of DC.

Cartesian PARABOLA, is a curve of the second order, expressed by the equation $xy = ax^3 + bx^2 + cx + d$, containing four infinite legs, *viz.* two hyperbolic ones, MM, B*m*, (plate CXCII. fig. 7.) (AE being the asymptote) tending contrary ways, and two parabolic legs BN, MN joining them, being the sixty-sixth species of lines of the third order, according to Sir Isaac Newton, called by him a trident: it is made use of by Des Cartes, in the third book of his Geometry, for finding the roots of equations of six dimensions by its intersections with a circle. Its most simple equation is $xy = x^3 + a^3$, and the points through which it is to pass, may be easily found by means of a common parabola, whose abscisis is $ax^2 + bx + c$, and an hyperbola whose abscisis is $\frac{d}{x}$; for y will be equal to the sum or difference of the correspondent ordinates of this parabola and hyperbola.

Diverging PARABOLA, a name given by Sir Isaac Newton to five different lines of the third order, expressed by the equation $yy = ax^3 + bx^2 + cx + d$.

Quadrature of the PARABOLA. See the article QUADRATURE.

PARABOLAN, *parabolanus*, in antiquity, a kind of gladiator, who rushed upon death. See the article GLADIATOR.

PARABOLIC ASYMPTOTE, in geometry, is used for a parabolic line approaching to a curve, so that they never meet; yet, by producing both indefinitely, their distance from each other becomes less than any given line. Mac Laurin observes, that there may be as many different kinds of these asymptotes as there are parabolas of different orders. See PARABOLA and ASYMPTOTE.

When a curve has a common parabola for its asymptote, the ratio of the subtangent to the abscisis approaches continually to the ratio of two to one, when the axis of the parabola coincides with the base; but this ratio of the subtangent to the abscisis approaches to that of one to two, when the axis is perpendicular to the base. And by observing the limit to which the ratio of the subtangent and abscisis approaches, parabolic asymptotes of various kinds may be discovered.

PARABOLIC CONOID, in geometry, a solid generated by the rotation of a parabola about its axis: its solidity is $= \frac{1}{2}$ of that of its circumscribing cylinder.

The circles, conceived to be the elements of this figure, are in arithmetical proportion, decreasing towards the vertex.

A parabolic conoid is to a cylinder of the same base and height, as 1 to 2, and to a cone of the same base and height, as $1\frac{1}{2}$ to 1. See the article GAUGING.

PARABOLIC CUNEUS, a solid figure formed by multiplying all the DB's (plate CXCII. fig. 8.) into the DS's; or, which amounts to the same, on the base APB erect a prism, whose altitude is AS; this will be a parabolical cuneus, which of necessity will be equal to the parabolical pyramidoid, as the component rectangles in one are severally equal to all the component squares in the other.

PARABOLIC PYRAMIDOID, a solid figure generated by supposing all the squares of the ordinate applicates in the parabola so placed, as that the axis shall pass through all the centers at right angles; in which case, the aggregate of the planes will form the parabolic pyramidoid.

The solidity hereof is had by multiplying the base by half the altitude, the reason of which is obvious; for the component planes being a series of arithmetical proportionals beginning from 0, their sum will be equal to the extremes multiplied by half the number of terms.

PARABOLIC SPACE, the area contained between any entire ordinate as VV (plate CXCII. fig. 9.) and the curve of the incumbent parabola.

The parabolic space is to the rectangle of the semi-ordinate into the abscisis, as 2 to 3; to a triangle inscribed on the ordinate as a base, it is as 4 to 3.

Every parabolical and paraboloidical ſpace is to the rectangle of the ſemiordinate into the abſciſs, as $r \times y (m+r)$ to xy; that is, as r to $m+r$.

Segment of a PARABOLIC SPACE, is that ſpace included between two ordinates.

PARABOLIC SPINDLE, in gauging; a caſk of the ſecond variety is called the middle fruſtum of a parabolic ſpindle.

The parabolic ſpindle is eight-fifteenths of its circumſcribing cylinder.

PARABOLOIDES, a name given to parabolas of the higher kind, which are algebraic curves. See the article CURVE.

PARACENTESIS, an operation in ſurgery, commonly called tapping.

In a paracenteſis of the abdomen, in order to diſcharge the water contained in dropſical ſubjects, the beſt method is to lay the patient on the ſide of his bed, and to inſert the trocar into the lower and lateral part of the cavity of the abdomen, at or about the diſtance of eight fingers-breadth from the navel, or in the middle of the ſpace between the navel and the angle of the os ilium, and after drawing out the ſharp pointed bodkin from the cannula, which is left in the wound, ſo much of the water may be drawn off at a time as the patient can well bear; and if the patient does not grow faint, the whole quantity may be drawn off at once. In order to keep him from fainting, the ſurgeon, or his aſſiſtant, muſt preſs both his hands on each ſide of the abdomen during the operation; or a broad linnen-ſwath perforated in the middle, may be put round the abdomen, and gradually drawn tighter till all the water is evacuated; after which a flannel compreſs, dipped in ſpirits of wine, may be placed on the wound, and retained by a tight roller.

If the patient can only bear to have a few pounds of water taken at a time, as the wound is but ſmall and almoſt cloſes of itſelf, it may be dreſſed only with a couple of ſquare compreſſes, a plaſter and bandage; and if his ſtrength will permit, the operation may be repeated the next day on the other ſide of the abdomen; and ſo on the third day, about two fingers-breadth from the laſt perforation: freſh wounds are made, rather than to keep open the firſt, becauſe wounds kept open in hydropical ſubjects, are in danger of mortifying.

In a paracenteſis of the thorax, to diſcharge water, blood, matter, or ſuch other preternatural ſubſtances as are there lodged, it is neceſſary to conſider, before the operation, in which ſide of the thorax the matter is contained, and what part of that cavity is moſt proper to be perforated. In order to diſcover the firſt, the ſurgeon ſhould learn in which ſide the patient has before had any pain or inflammation; in what part he perceives the weight and fluctuation of matter; on which ſide he can lie eaſier than on the other: for that is uſually the ſide affected; the perſon not being able to lie on the ſound ſide, becauſe of the weight or preſſure of the matter on the mediaſtinum; and, laſtly, he may generally perceive ſome tumour, or inflammatory heat on the ſide affected. Having diſcovered which ſide of the thorax is to be perforated, the operation may then be ſafely performed between the ſecond and third of the ſpurious ribs on the left ſide, or between the third and fourth on the right ſide, counting from below upwards, ſo as to be about five or ſix fingers-breadth from the ſpine of the back, and as much below the angle of the ſcapula. The ſurgeon having marked the deſcribed place with ink, and taken up the integuments between his own fingers and thoſe of an aſſiſtant, as in cutting iſſues, he makes an inciſion about two inches long, according to the courſe of the ribs; then cautiouſly divides the intercoſtal muſcles and pleura by a tranſverſe inciſion with the ſcalpel; and having introduced the cannula, the contained humours of the thorax are thereby diſcharged. During the operation the patient ſhould be retained in an inclined poſture, by which means the ribs will be elevated more from each other, and a large ſpace made for the inciſion; and a ſufficient opening being made in the thorax, the finger is then to be introduced, in order to ſeparate the lungs from its adheſions to the pleura, and to make way for the peccant humours. After theſe are diſcharged, the orifice of the wound is to be ſtopped with a piece of ſoft linen rag rolled up, by which it may be kept open for future diſcharges; but over the orifice of the wound is to be applied ſoft lint, faſtened with thread, and over that a plaſter, compreſs and bandage. The dreſſing may afterwards be made once or twice a day, diſcharging and waſhing out the matter by injecting a decoction of vulnerary herbs. Theſe injections ſhould be continued till they are obſerved to re-

turn

turn clean, and unmixed with bloody or purulent matter, which is a ſign the parts are healed; on which the convoluted linen-rag and lint may be withdrawn, and the reſt of the cure completed, as directed under wounds of the thorax. For the method of performing a paracenteſis of the ſcrotum, ſee HYDROCELE.

PARACENTRIC MOTION, in aſtronomy, denotes ſo much as a revolving planet approaches nearer to, or recedes from, the ſun, or center of attraction. Thus SB — SA = *b* B (plate CXCIII. fig. 4.) is the paracentric motion of the planet A.

PARACENTRIC *ſolicitation of gravity*, is much the ſame with the centripetal force; and, in aſtronomy, is expreſſed by the line A L *(ibid.)* drawn from the point A parallel to the ray S B, infinitely near S B, till it interſect the tangent B L.

PARACLET, the COMFORTER, a name given to the Holy Ghoſt. See the article TRINITY.

PARACYNANCHE, or PARASYNANCHE. See the article PARASYNANCHE.

PARADE, the placing any thing to public view, with all its advantages and ornaments.

PARADE, in war, is a place where the troops meet to go upon guard, or any other ſervice.

In a garriſon where there are two, three, or more regiments, each have their parade appointed, where they are to meet upon all occaſions, eſpecially upon any alarm. And in a camp, all parties, convoys, and detachments have a parading place appointed them at the head of ſome regiment.

PARADE, in fencing, is the action of parrying or turning off any thruſt. See the article PARRYING.

PARADIGM, an example or inſtance of ſomething ſaid or done.

PARADISE, a term principally uſed for the garden of Eden, in which Adam and Eve were placed immediately upon their creation.

As to this terreſtrial paradiſe, there have been many enquiries about its ſituation. It has been placed in the third heaven, in the orb of the moon, in the moon itſelf, in the middle region of the air, above the earth, under the earth, in the place poſſeſſed by the Caſpian ſea, and under the arctic pole. The learned Huetius places it upon the river that is produced by the conjunction of the Tigris and Euphrates, now called the river of the Arabs, between this conjunction and the diviſion made by the ſame river before it falls into the Perſian ſea. Other geographers have placed it in Armenia, between the ſources of the Tigris, the Euphrates, the Araxis, and the Phaſis, which they ſuppoſe to be the four rivers deſcribed by Moſes.

The celeſtial paradiſe is that place of pure and refined delight, in which the ſouls of the bleſſed enjoy everlaſting happineſs. In this ſenſe it is frequently uſed in the New Teſtament: our Saviour tells the penitent thief on the croſs, "This day ſhalt thou be with me in paradiſe;" and St. Paul ſpeaking of himſelf in the third perſon, ſays, "I knew a man who was caught up into paradiſe, and heard unſpeakable words, which it is not lawful for a man to utter."

Mahomet has promiſed his followers a paradiſe of mere ſenſual delights.

Bird of PARADISE, *paradiſæa*, in ornithology, a genus of birds of the order of the picæ, the beak of which is of a cultratotubulated form, and acute; the forehead is gibbous, and the two middle feathers are extremely long, and very firm.

Of this genus there are a great many elegant ſpecies. 1. The greater bird of paradiſe, about the ſize of a black-bird; in which, what may be called the two middle feathers of the tail, ſpring from the rump, and are only the ſtems of feathers without the web.

2. The ſuppoſed king of the greater birds of paradiſe; being about the ſize of a chaffinch, only that the bill is longer, and the legs ſtronger in proportion; it has a very ſhort tail, from the middle of which ſpring two rigid ſtems of feathers, which at the points are beſet with a web on one ſide, and curled.

3. The pyed and creſted bird of paradiſe, with two extraordinary long tail-feathers: it is nearly of the ſize of the ſecond ſpecies.

PARADOX, in philoſophy, a propoſition ſeemingly abſurd, as being contrary to ſome received opinion; but yet true in fact.

No ſcience abounds more with parodoxes than geometry: thus, that a right line ſhould continually aproach to the hyperbola, and yet never reach it, is a true paradox; and in the ſame manner, a

ſpiral

ſpiral may continually approach to a point, and yet not reach it, in any number of revolutions, however great.

PARÆA, ÆSCULAPIUS'S SERPENT, in zoology, a ſpecies of coluber, with the ſcuta of the abdomen one hundred and ninety, and the ſquamæ of the tail forty-two. See the article COLUBER.

PARAGE, in law, an equality of blood or dignity, but eſpecially of land, in the partition of an inheritance between coheirs. See the article HEIR.

PARAGOGE, in grammar, a figure whereby a letter or ſyllable is added to the end of a word; as *med*, for *me*; *dicier*, for *dici*, &c.

PARAGORICS, or PAREGORICS. See the articles PAREGORICS.

PARAGOYA, one of the Philippine iſlands, a little north of Borneo.

PARAGRAPH, in general, denotes a ſection or diviſion of a chapter, and in references is marked thus ¶.

PARAGUAY, or LA PLATA, a province of South America, ſubject to Spain, lies between 12° and 37° ſouth lat. and between 50° and 75° weſt long.

The paraguay-tea, ſo much valued in Peru, Chili, and other parts of South America, is the produce of a ſhrub, the genus of which is not known: its leaves are ſaid to be like thoſe of ſena, and infuſed in hot-water, yield a tea not unlike that obtained from the oriental kind. See the article TEA.

PARAIBA, the moſt northern province of Braſil, ſituated on the ſouth-ſide of the mouth of the river Amazon.

PARALEPSIS, παραλειψις, in rhetoric, the pretence of paſſing over a thing, and yet mentioning it by the bye.

PARALIPOMENA, παραλειπομενα, in matters of literature, denotes a ſupplement of things omitted in a preceding work.

The two books of Chronicles, in the canon of the ſcripture, are often termed paralipomena, as being a kind of ſupplement to thoſe of Kings. See the articles CHRONICLES and KINGS.

PARALLACTIC, in general, ſomething relating to the parallax of heavenly bodies. See the article PARALLAX.

The parallactic angle of a ſtar, *&c.* is the difference of the angles C E A, (plate CXCIII fig. 5. n° 1.) B T A, under which its true and apparent diſtance from the zenith is ſeen; or, which is the ſame thing, it is the angle T S E.

The ſines of the parallactic angles A L T, A S T (*ibid.* n° 2.) at the ſame or equal diſtances, Z S, from the zenith, are in the reciprocal ratio of the diſtances T L, and T S, from the center of the earth.

PARALLACTIC MACHINE, that repreſented in plate CXCIII. fig. 6. n° 1. the uſe of which is to find, at any hour of the day, a ſtar whoſe declination and right aſcenſion is given. Its conſtruction is thus: upon the frame A B D C ſtands two pieces of wood K S, O R, placed obliquely; theſe ſupport a kind of trapezium S 1 2 G, formed likewiſe of wood: in the middle of this trapezium is a cylindrical wooden axis, which at one end reſts upon the ſide 1 2, and at the other end upon the ſide S G; both which are perforated for this purpoſe. The lower end of this axis coincides with the center of a circle delineated upon the piece 1 2, as repreſented *ibid.* n° 2. this circle is furniſhed with an index, that moves round it, in proportion as the axis turns. The upper end of the axis is placed between two concave ſemi-circles N, Q, which may be ſcrewed together in ſuch a manner, as to allow the end of the axis only ſufficient room to move: one of theſe ſemi-circles is graduated; and this end of the axis ſuſtains the piece of wood X Z, hollowed ſo as to receive the teleſcope L L, and with a channel cut in it ſo as to move upon the axis; the degrees of which movement are marked by an index, that turns round the ſemi-circle N Q. This axis has, by this means, two motions, one from right to left about the point 3, and the other up and down about the point 4; the former being from eaſt to weſt, when the machine is properly placed, and the other from ſouth to north.

In order to adjuſt the machine, the angle formed by the axis and the vertical S V, muſt be equal to the elevation of the pole at the place where the obſervation is made: then the machine is to be placed in the ſituation E F, ſo that the axis G 3 may coincide with the meridian of the place. Then the teleſcope is moved up and down, till the index 4 mark upon the ſemi-circle 5 0 6 the degree of the declination of the ſtar; which ought to be from 0 towards 6, when the declination is ſouthern; and from 0 towards 5, when the declination is northern. Then, by means of the right aſcenſion, find when the ſtar will be on the meridian: and converting the time between noon and the hour given into degrees, this will

give

Fig. 1. PALL.

Fig. 2. PALY.

Fig. 3 PARTI PER PALE.

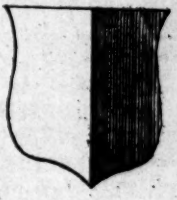
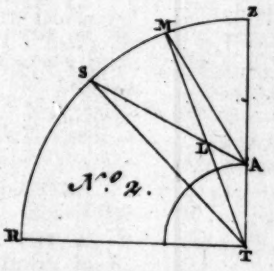


Fig. 4. PARACENTRIC.

Fig. 5. PARALLACTIC ANGLE.



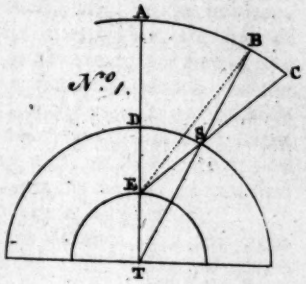


Fig. 7. PARALLAX.

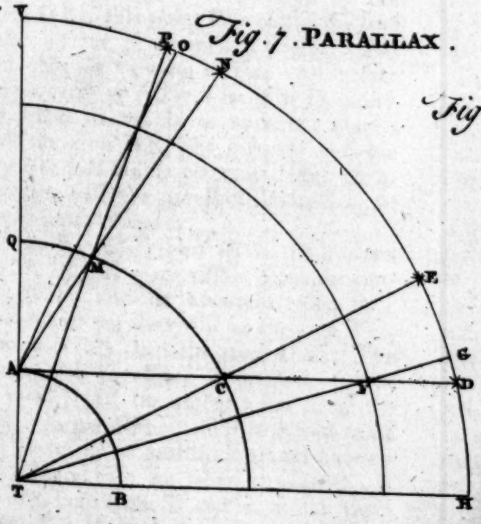
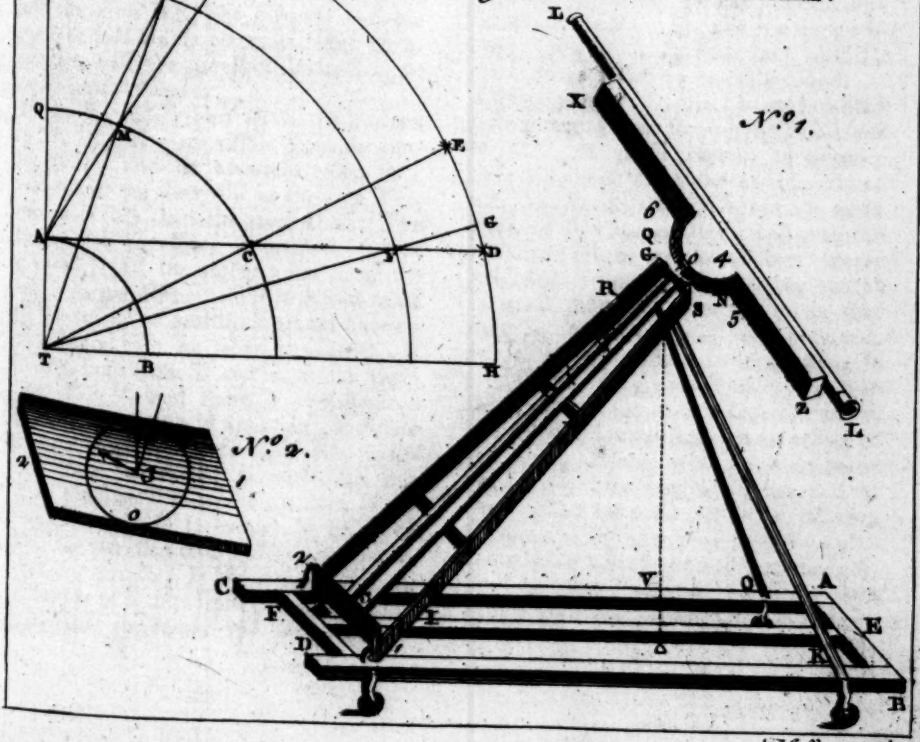


Fig. 6. PARALLACTIC MACHINE.



J. Jefferys sculp.

BRITISH MUSEUM

give the aſcenſional difference; which muſt be marked by turning the axis of the machine, till the index 3 ſtands over the degree of right aſcenſion, which ſhould be from o towards 2, when the ſtar is not arrived at the meridian; and from o towards 1, when it hath paſſed the meridian. In this ſituation of the machine, the center of the teleſcope will be directed towards the ſtar ſought, which may be thus ſeen even in the day-time.

PARALLAX, παραλλαξις, in aſtronomy, denotes a change of the apparent place of any heavenly body, cauſed by being ſeen from different points of view; or it is the difference between the true and apparent diſtance of any heavenly body from the zenith.

Thus let AB (plate CXCIII. fig. 7.) by a quadrant of a great circle on the earth's ſurface, A the place of the ſpectator, and the point V in the heavens the vertex and zenith. Let VNH repreſent the ſtarry firmament, AD the ſenſible horizon, in which ſuppoſe the ſtar C to be ſeen, whoſe diſtance from the center of the earth is TC. If this ſtar were obſerved from the center T, it would appear in the firmament in E, and elevated above the horizon by the arch DE: this point E is called the true place of the phænomenon or ſtar. But an obſerver viewing it from the ſurface of the earth at A, will ſee it at D, which is called its viſible or apparent place; and the arch DE, the diſtance between the true and viſible place, is what aſtronomers call the parallax of the ſtar, or other phænomenon.

If the ſtar riſe higher above the horizon to M, its true place viſible from the center is P, and its apparent place N; whence its parallax will be the arch PN, which is leſs than the arch DE. The horizontal parallax, therefore, is the greateſt; and the higher a ſtar riſes, the leſs is its parallax; and if it ſhould come to the vertex or zenith, it would have no parallax at all: for when it is in Q, it is ſeen both from T and A in the ſame line TAV, and there is no difference between its true and apparent or viſible place. Again, the farther a ſtar is diſtant from the earth, ſo much the leſs is its parallax: thus the parallax of the ſtar F is only GD, which is leſs than DE the parallax of C. Hence it is plain, that the parallax is the difference of the diſtances of a ſtar from the zenith when ſeen from the center and from the ſurface of the earth: for the true diſtance of the ſtar M from the zenith is the arch VP, and its apparent diſtance VN, the difference between which PN is the parallax.

Theſe diſtances are meaſured by the angles VTM, and VAM, but VAM—VTM=TMA. For the external angle VAM=∠ATM+∠AMT, the two inward and oppoſite angles; ſo that AMT meaſures the parallax, and upon that account is itſelf frequently called the parallax: and this is always the angle under which the ſemi-diameter of the earth AT, appears to an eye placed in the ſtar; and therefore where this ſemi-diameter is ſeen directly, there the parallax is greateſt, *viz.* in the horizon. When the ſtar riſes higher, the ſine of the parallax is always to the ſine of the ſtar's diſtance from the zenith, as the ſemi-diameter of the earth to the diſtance of the ſtar from the earth's center: hence if the parallax of a ſtar be known at any one diſtance from the zenith, we can find its parallax at any other diſtance.

If we have the diſtance of a ſtar from the earth, we can eaſily find its parallax: for on the triangle TAC *(ibid.)* rectangular at A, having the ſemi-diameter of the earth, and TC the diſtance of the ſtar, the angle ACT, which is the horizontal parallax, is found by trigonometry; and, on the other hand, if we have this parallax, we can find the diſtance of the ſtar; ſince in the ſame triangle, having AT, and the ∠ACT, the diſtance TC may be eaſily found.

Aſtronomers, therefore, have invented ſeveral methods for finding the parallaxes of ſtars, in order thereby to diſcover their diſtances from the earth. However, the fixed ſtars are ſo remote as to have no ſenſible parallax; and even the ſun, and all the primary planets, except mars and venus when in perigee, are at ſo great diſtances from the earth, that their parallax is too ſmall to be obſerved. In the moon, indeed, the parallax is found to be very conſiderable, which in the horizon amounts to a degree or more, and may be found thus: in an eclipſe of the moon, obſerve when both its horns are in the ſame vertical circle, and at that inſtant take the altitudes of both horns: the difference of theſe two altitudes being halved and added to the leaſt, or ſubtracted from the greateſt, gives nearly the viſible or apparent altitude of the moon's center; and the true altitude

is

is nearly equal to the altitude of the center of the ſhadow at that time. Now we know the altitude of the ſhadow, becauſe we know the place of the ſun in the ecliptic, and its depreſſion under the horizon, which is equal to the altitude of the oppoſite point of the ecliptic in which is the center of the ſhadow. And therefore having both the true altitude of the moon and the apparent altitude, the difference of theſe is the parallax required. But as the parallax of the moon increaſes as ſhe approaches towards the earth, or the perigæum of her orbit; therefore aſtronomers have made tables, which ſhew the horizontal parallax for every degree of its anomaly.

The parallax always diminiſhes the altitude of a phænomenon, or makes it appear lower than it would do, if viewed from the center of the earth; and this change of the altitude may, according to the different ſituation of the ecliptic and equator in reſpect of the horizon of the ſpectator, cauſe a change of the latitude, longitude, declination and right aſcenſion of any phænomenon, which is called their parallax. The parallax, therefore, increaſes the right and oblique aſcenſion; diminiſhes the deſcenſion; diminiſhes the northern declination and latitude in the eaſtern part, and increaſes them in the weſtern; but increaſes the ſouthern both in the eaſtern and weſtern part; diminiſhes the longitude in the weſtern part, and increaſes it in the eaſtern. Hence it appears, that the parallax has juſt oppoſite effects to refraction. See the article REFRACTION.

Annual PARALLAX, the change of the apparent place of a heavenly body, which is cauſed by being viewed from the earth in different parts of its orbit round the ſun. See the article EARTH.

The annual parallax of all the planets is found very conſiderable, but that of the fixed ſtars is imperceptible. See STAR.

PARALLAX, in levelling, denotes the angle contained between the line of the true level, and that of the apparent level.

PARALLEL, in geometry, an appellation given to lines, ſurfaces, and bodies every where equidiſtant from each other; and which, though infinitely produced, would never meet: thus the line O P, (plate CXCIV. fig. 1.) is parallel to Q R.

Geometricians demonſtrate, that if two parallels, O P and Q R *(ibid.)* be cut by a tranſverſe line S T in A and B; 1. The alternate angles *x* and *y* are equal. 2. The external angle *u* is equal to the internal oppoſite one *y*. And, 3. The two internal oppoſite ones *x* and *s*, are alſo equal to two right angles.

It is ſhewn on the principles of optics, that if the eye be placed between two parallel lines, they will appear to converge towards a point oppoſite to the eye. And if they run to ſuch a length, as that the diſtance between them be but as a point thereto, they will there appear to coincide.

Parallel lines are deſcribed by letting fall equal perpendiculars, and drawing lines through the extremes.

PARALLEL PLANES, are ſuch planes as have all the perpendiculars drawn betwixt them equal to each other.

PARALLEL RAYS, in optics, are thoſe which keep at an equal diſtance from the viſible object to the eye, which is ſuppoſed to be infinitely remote from the object.

PARALLEL RULER, or PARALLELISM, an inſtrument conſiſting of two wooden, braſs, *&c.* rulers A B, C D (*ibid.* fig. 4.) equally broad every where; and ſo joined together by the croſs blades E F and G H, as to open to different intervals, accede and recede, and yet ſtill retain their parallèliſm.

The uſe of this inſtrument is obvious; for one of the rulers being applied to R S, and the other withdrawn to a given point V, a right line A B, drawn by its edge through V, is a parallel to R S.

PARALLELS, or PARALLEL CIRCLES, in geography, called alſo parallels, or circles of latitude, are leſſer circles of the ſphere conceived to be drawn from weſt to eaſt, through all the points of the meridian, commencing from the equator to which they are parallel, and terminating with the poles.

They are called parallels of latitude, becauſe all places lying under the ſame parallel, have the ſame latitude.

PARALLELS *of latitude*, in aſtronomy, are leſſer circles of the ſphere parallel to the ecliptic, imagined to paſs through every degree and minute of the colures.

They are repreſented on the globe by the diviſions on the quadrant of altitude, in its motion round the globe, when ſcrewed over the pole of the ecliptic. See the article GLOBE.

PARALLELS *of altitude*, or ALMUCANTARS, are circles parallel to the horizon, imagined to paſs through every degree and minute of the meridian between the horizon

BRITISH MUSEUM

Fig. 1. PARALLEL LINES.

Fig. 2. PARALLELOGRAM.

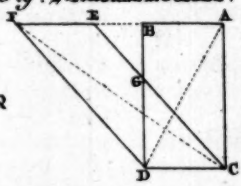


Fig. 3. PARALLELOPIPED.

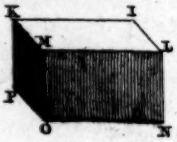


Fig. 4. PARALLEL RULER.

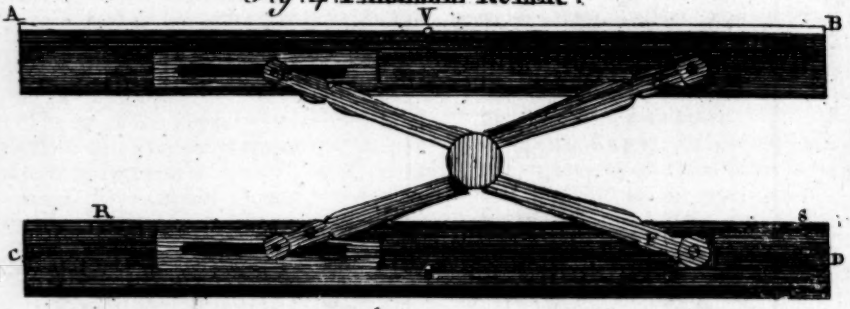


Fig. 5. PASSION-CROSS.

Fig. 6. PATEE.

Fig. 7. PATRIARCHAL CROSS.

Fig. 8. PASSIFLORA, *PASSION-FLOWER*.

Fig. 9. PEACOCK-FISH.

J. Jefferys sculp.

horizon and zenith, having their poles in the zenith.

They are repreſented on the globe by the diviſions on the quadrant of altitude, in its motion about the body of the globe, when ſcrewed to the zenith.

PARALLELS *of declination*, in aſtronomy, are the ſame with parallels of latitude in geography.

PARALLEL SPHERE, that ſituation of the ſphere, wherein the equator coincides with the horizon, and the poles with the zenith and nadir. See SPHERE.

In this ſphere all the parallels of the equator become parallels of the horizon, conſequently, no ſtars ever riſe or ſet, but all turn round in circles parallel to the horizon; and the ſun when in the equinoctial, wheels round the horizon the whole day. After his riſing to the elevated pole, he never ſets for ſix months; and after his entering again on the other ſide of the line, never riſes for ſix months longer.

This is the poſition of the ſphere to ſuch as live under the poles, and to whom the ſun is never above 23° 30′ high.

PARALLEL SAILING, in navigation, is the ſailing under a parallel of latitude. See the article NAVIGATION.

PARALLELEPIPED, or PARALLELOPIPED, in geometry, a regular ſolid comprehended under ſix parallelograms, the oppoſite ones whereof are ſimilar, parallel, and equal, as in plate CXCIV. fig. 3.

All parallelepipeds, priſms, cylinders, &c. whoſe baſes and heights are equal, are themſelves equal.

A diagonal plane divides a parallelepiped into two equal priſms; ſo that a triangular priſm is half a parallelepiped upon the ſame baſe, and of the ſame altitude.

All parallelepipeds, priſms, cylinders, &c. are in a ratio compounded of their baſes and altitudes: wherefore, if their baſes be equal, they are in proportion to their altitudes; and converſely.

All parallelepipeds, cylinders, cones, &c. are in a triplicate ratio, of their homologous ſides, and alſo of their altitudes.

Equal parallelepipeds, priſms, cones, cylinders, &c. reciprocate their baſes and altitudes.

To meaſure the ſurface and ſolidity of a parallelepiped.

Find the areas of the parallelogram, ILMK, LMON, and OMKP (*ibid.*) add theſe into one ſum, and multiply that ſum by 2, the factum will be the ſurface of the parallelepiped.

If then the baſe ILMK be multiplied by the altitude MO, the product will be the ſolidity.

PARALLELISM, the ſituation or quality whereby any thing is denominated parallel. See the article PARALLEL.

PARALLELISM *of the earth's axis*, in aſtronomy, that ſituation of the earth's axis, in its progreſs through its orbit, whereby it is ſtill directed towards the pole-ſtar; ſo that if a line be drawn parallel to its axis, while in any one poſition, the axis, in all other poſitions, will be always parallel to the ſame line.

This paralleliſm is the reſult of the earth's double motion, *viz.* round the ſun, and round its own axis; or its annual and diurnal motion; and to it we owe the viciſſitudes of ſeaſons, and the inequality of day and night. See the article EARTH.

PARALLELISM *of the rows of trees*. Theſe are never ſeen parallel, but always inclining to each other towards the farther extreme. Hence mathematicians have taken occaſion to enquire in what lines the trees muſt be diſpoſed to correct this effect of the perſpective, and make the rows ſtill appear parallel. The two rows muſt be ſuch, as that the unequal intervals of any two oppoſite or correſpondent trees may be ſeen under equal viſual rays.

On this principle, ſome have ſhewn that the two rows of trees muſt be two oppoſite ſemi-hyperbolas; but Mr. Varignon, in Mem. de l'Acad. ann. 1717, renders the problem much more general, and requires not only that the viſual angles be equal, but to have them increaſe or decreaſe in any given ratio, provided the greateſt do not exceed a right angle. The eye he requires to be placed in any point, either juſt at the beginning of the ranges, beyond or on this ſide.

He ſuppoſes the firſt row to be a right line, and ſeeks what line the other muſt be, which he calls the curve of the range: this he finds muſt be an hyperbola to have the viſual angles equal. The ſtraight and hyperbolical rows will be ſeen parallel to infinity; and if the oppoſite ſemi-hyperbola be added, we ſhall have three rows of trees, the ſtraight one in the middle, and all three parallel.

It is ſufficient that this ſecond hyperbola have the ſame center, its vertex in the ſame right line, and the ſame conjugate axis. Thus the two hyperbola's may be of all the different kinds poſſible, yet all have the ſame effect.

If it be required to have the trees appear under decreaſing angles, the ſtraight row being laid down as before, he ſhews, that if the decreaſe be in a certain ratio, the other line muſt be a parallel ſtraight line. But he goes yet farther, and ſuppoſing the firſt row any curve whatever, he ſeeks for another that ſhall make the rows have any effect deſired.

PARALLELOGRAM, in geometry, a quadrilateral right-lined figure, whoſe oppoſite ſides are parallel and equal to each other. It is generated by the equable motion of a right line always parallel to itſelf. When it has all its four angles right, and only its oppoſite ſides equal, it is called a rectangle or oblong. When the angles are all right, and the ſides equal, it is called a ſquare. If all the ſides are equal, and the angles unequal, it is called a rhombus or lozenge: and if the ſides and angles be unequal, it is called a rhomboides.

Properties of the PARALLELOGRAM. In every parallelogram of what kind ſoever, as ABCD (plate CXCIV. fig. 2.) a diagonal DA divides it into two equal parts; the angles diagonally oppoſite B, C, and A, D, are equal; the oppoſite angles of the ſame ſide C, D, and A, B, *&c.* are together equal to two right angles; and each two ſides, together, greater than the diagonal.

Two parallelograms ABCD, and EC DF, on the ſame or equal baſe CD, and of the ſame height AC, or between the ſame parallels AF, CD, are equal: and hence two triangles CDA, and CDF, on the ſame baſe and of the ſame height, are alſo equal. Hence, alſo, every triangle CFD is half a parallelogram ACDB upon the ſame or an equal baſe CD, and of the ſame altitude, or between the ſame parallels. Hence, alſo, a triangle is equal to a parallelogram, having the ſame baſe, and half the altitude, or half the baſe, and the ſame altitude.

Paralellograms, therefore, are in a given ratio compounded of their baſes and altitudes. If then the altitudes be equal, they are as the baſes, and converſely.

In ſimilar parallelograms and triangles, the altitudes are proportional to the homologous ſides, and the baſes are cut proportionably thereby. Hence ſimilar parallellograms and triangles are in a duplicate ratio of their homologous ſides; as alſo of their altitudes, and the ſegments of their baſes; they are, therefore, as the ſquares of the ſides, altitudes, and homologous ſegments of the baſes.

In every parallelogram, the ſum of the ſquares of the two diagonals is equal to the ſum of the ſquares of the four ſides.

For if the parallelogram be rectangular, it follows, that the two diagonals are equal; and, conſequently, the ſquare of a diagonal, or, which comes to the ſame thing, the ſquare of the hypothenuſe of a right angle, is equal to the ſquares of the ſides.

If the parallelogram be not rectangular, and of conſequence the two diagonals be not equal, which is the moſt general caſe, the propoſition becomes of vaſt extent; for inſtance, in the whole theory of compound motions, *&c.* There are three ways of demonſtrating this problem; the firſt by trigonometry, which requires twenty one operations; the ſecond geometrical and analytical, which requires fifteen. M. de Lagny gives the third method in the Mem de l'Acad. which only requires ſeven.

To find the area of the rectangled PARALLELOGRAM ABCD; find the length of the ſides AB and AC; multiply AC ſuppoſed = 345 into AB, = 123, the produce will be the area of the parallelogram, namely, 11385. Hence, 1. Rectangles are in a ratio compounded of their ſides AC and AB. 2. If, therefore, three lines be continually proportional, the ſquare of the middle one is equal to the rectangle of the two extremes: and, if four lines be proportional, the rectangle under the two extremes is equal to that under the two middle terms.

Other parallelograms, not rectangular, have their areas found by reſolving them, by diagonals, into two triangles, and adding the areas of the ſeparate triangles into one ſum.

PARALLELOGRAM, or PARALLELISM, a machine for the ready reduction of deſigns; it is the ſame with the pentagraph. See the article PENTAGRAPH

PARALLELOPIPED. See the article PARALLELEPIPED.

PARALLELOPIPEDIA, in natural hiſtory, the name of a genus of ſpars, thus called, becauſe regularly of a parallelopiped form. See the article SPAR.

They are pellucid cryſtaline ſpars externally of a determinate and regular figure, always found looſe, detached, and

and ſeparate from all other bodies, and in form of an oblique parallelopiped, with ſix parallelogram ſides and eight ſolid angles, eaſily fiſſile, either in an horizontal or perpendicular direction, being compoſed of numbers of thin plates, and thoſe of very elegantly and regularly arranged bodies, each of the ſame form with the whole maſs, except that they are thinner in proportion to their horizontal planes; and naturally fall into theſe and no other figures, on being broken with a ſlight blow. Of this genus there are four known ſpecies. 1. The hard, pellucid, and colourleſs one, called the iſland-cryſtal of authors. See the article ISLAND-CRYSTAL.

2. A dull and whitiſh kind, found in France, Germany, and England, particularly in the Derbyſhire and Yorkſhire lead-mines, and about Scarborough. This has the ſame property with the former, of giving a double refraction; but it is ſo dull and opake, that it does not ſhew it ſo elegantly. 3. A ſoft, whitiſh, and very bright one, found principally in the lead-mines of Yorkſhire, and about the ſea-ſhores of that country. And, 4. A dull, hard, and pale-brown one: this is found in the lead mines of the ſame country, and in ſome parts of Ireland. All theſe ſpecies have the ſame power of double refraction with the firſt, but are too opake to ſhew it ſo beautifully, and often have not tranſparency enough to make it at all diſtinguiſhable.

PARALOGISM, in logic, a falſe reaſoning, or a fault committed in demonſtration, when a conſequence is drawn from principles that are falſe; or, though true, are not proved; or when a propoſition is paſſed over that ſhould have been proved by the way.

A paralogiſm differs from a ſophiſm in this, that the ſophiſm is committed out of deſign and ſubtlety, and the paralogiſm out of miſtake and for want of ſufficient light and application. See the article SOPHISM and DEMONSTRATION.

PARALYSIS, the PALSY. See the article PALSY.

PARALYTIC, a perſon afflicted with the palſy. See the article PALSY.

PARAMECIA, in natural hiſtory, a name given to ſuch animalcules as have no viſible limbs or tails, and are of an irregularly oblong figure. See the article ANIMALCULE.

PARAMESE, in the antient muſic, the note above the meſe, in the greek ſcale; correſponding to a-la-mire, of Guido's ſcale. See the article DIAGRAM.

PARAMETER, in conic ſections, a conſtant line, otherwiſe called latus rectum. See the articles ELLIPSIS, HYPERBOLA, and PARABOLA.

The parameter is ſaid to be conſtant, becauſe in the parabola, the rectangle under it and any abſciſs is always equal to the ſquare of the correſponding ſemi-ordinate; and in the ellipſis and hyperbola, it is a third proportional to the conjugate and tranſverſe axis.

PARAMOUNT, in law ſignifies the ſupreme lord of the fee. See FEE.

The lords of thoſe honours or manors that have other manors under them are ſtiled lords paramount; and the king, by our law is the chief lord of all the lands in England. See MANOR.

PARANA, a province of Paraguay, ſubject to Spain.

PARANETE, in antient muſic, a chord or note of the greek-ſcale. See the article DIAGRAM.

PARANYMPH, *paranymphus*, among the antients, the perſon who waited on the bridegroom, and directed the nuptial ſolemnities; called alſo pronubus, and auſpex, becauſe the ceremonies began by taking auſpicia. As the paranymph officiated only on the part of the bride-groom, a woman called pronuba, officiated on the part of the bride.

PARAPET, in fortification, an elevation of earth deſigned for covering the ſoldiers from the enemies cannon or ſmall ſhot. The thickneſs of the parapet is from eighteen to twenty feet; its height is ſix feet on the inſide, and four or five on the outſide. It is raiſed on the rampart, and has a ſlope above called the ſuperior talus, and ſometimes the glacis of the parapet. The exterior talus of the parapet is the ſlope facing the country: there is a banquette or two for the ſoldiers, who defend the parapet to mount upon, that they may the better diſcover the country, foſſe, and counterſcarpe, and fire as they find occaſion. See GLACIS, TALUS, BANQUET, &c.

Parapet of the covert-way, or corridor, is what covers that way from the ſight of the enemy, which renders it the moſt dangerous place for the beſiegers, becauſe of the neighbourhood of the

faces, flanks, and curtins of the place.

PARAPET is alſo a little wall raiſed breaſt high on the banks of bridges, keys, or high buildings, to ſerve as a ſtay, and prevent people's falling over.

PARAPHERNALIA, or PARAPHERNA, in the civil law, thoſe goods which a wife brings her huſband beſides her dower, and which are ſtill to remain at her diſpoſal excluſive of her huſband, unleſs there are ſome proviſion made to the contrary in the marriage-contract. Some of our engliſh civilians define the paraphernalia to be ſuch goods as a wife challengeth over and above her dower or jointure, after her huſband's death, as furniture for her chamber, wearing apparel, and jewels, which are not to be put into the inventory of her huſband's goods: and a french civilian calls paraphernalia the moveables, linen, and other female neceſſaries, which are adjudged to a wife in prejudice of the creditors, when ſhe renounces the ſucceſſion of her huſband.

PARAPHIMOSIS, in medicine, a diſorder of the penis, wherein the prepuce is ſhrunk, and withdrawn behind the glans, ſo as not to be capable of being brought to cover the ſame; which generally happens in venereal diſorders. See the article PREPUCE, *&c.*

In this caſe, it is uſual for the glans to be not only much tumified, inflamed, and painful from the ſtricture, but the free circulation of the blood being thereby obſtructed, will ſhortly bring on a mortification. Thoſe are moſt ſubject to a paraphimoſis who have naturally a ſhort prepuce, and are too intenſe in their embraces with women, who have very ſtrait paſſages, particularly virgins. Boys are ſometimes afflicted with this diſorder, when they laciviouſly draw back their prepuce, being extremely narrow, and afterwards cauſing an erection, it cannot be returned over the glans. But the paraphimoſis oftener ariſes from unclean embraces, for the prepuce being inflamed and tumified by the infectious matter imbibed by it, generally produces this diſorder, when it is alſo naturally ſhort. See the article GONORRHOEA, *&c.*

The cure of a paraphimoſis, according to Heiſter, conſiſts chiefly in returning the contracted prepuce over the naked glans; but as a violent inflammation is uſually the chief cauſe of its being ſo difficult to return the prepuce in the paraphimoſis, it may be firſt proper to make uſe of diſcutient and emollient ſomentations or cataplaſms, with camphorated ſpirit of wine before the prepuce is attempted to be drawn over the glans, which being effected, all the other bad ſymptoms will vaniſh of courſe. However ſome ſurgeons prefer the uſe of cold water, becauſe the former remedies often augment the influx of the blood to the parts, and ſo increaſe the tumour. But when the penis, ſcrotum, and lower part of the abdomen, are immerged in cold water, with plentiful bleeding, the tumor generally ſubſides in a ſhort time: the penis is then to be held between the ſurgeons two foremoſt fingers of each hand, and the glans, having been firſt lubricated with oil or butter, is to be forcibly preſſed back with his thumbs, whilſt the prepuce is at the ſame time drawn forward under his fingers, ſo as to cover the denudated glans; but when the inflammation is not very large, it may be often ſufficient only to bathe the parts in warm water, when there is little or no virulency. On the contrary, when the tumefied penis tends to mortify through the violence of the inflammation, or long continuance of the diſorder, it will be moſt adviſeable to bleed the patient firſt in the arm, and then in the vena dorſalis penis, in which laſt it ſhould be continued till the tumour ſubſides, and then the prepuce may be drawn over the glans as before: and if a gangrene or incipient mortification in the penis, ſhould actually ſucceed a paraphimoſis, it ſhould be treated as before directed, under the articles GANGRENE and MORTIFICATION.

Sometimes the prepuce is ſo much diſtended with the ſerous part of the blood, that it appears like a bliſter raiſed by fire, or a veſicatory: in this caſe it may be proper to make a few punctures with a lancet or ſcalpel to diſcharge the diſtending lymph, and after waſhing the parts in warm wine, the prepuce is to be extended over the glans as before. But to prevent the wounded prepuce from growing to the glans, the patient ſhould frequently draw it backwards and forwards, and wet his glans over with his urine when he makes water, which he ſhould continue till there is no danger of their adhering together: but if, by accident or neglect, there ſhould be ſuch a coheſion of the glans and prepuce, it ought to

to be immediately ſeparated by the lancet or a proper ſcalpel, taking great care not to wound the glans. When all the preceeding means prove ineffectual, M. Petit's method of proceeding is to incite the diſtended or contracted prepuce, by inſerting a ſmall and crooked ſcalpel with the edge outward, and the back towards the glans, and thus he divides the prepuce by inciſion in three, four, or more places, according as the degree of diſtention makes it neceſſary; and after waſhing the inciſed parts in warm wine, and reducing the prepuce over the glans covered with a little ſoft lint, the penis is bound up.

PARAPHRASE, παραφρασις, an explanation of ſome text, in clearer and more ample terms, whereby is ſupplied what the author might have ſaid or thought on the ſubject; ſuch are eſteemed Eraſmus's paraphraſe on the New Teſtament, the Chaldee paraphraſe on the pentateuch, &c.

PARAPHRENITIS, in medicine, an inflammation of the diaphragm. See INFLAMMATION, and DIAPHRAGM.

A paraphrenitis, according to Boerhaave, is attended with a very acute and continual fever; an intolerable inflammatory pain of the part affected, which is extremely augmented by inſpiration, coughing, ſneezing, repletion of the ſtomach, a nauſea, vomiting, compreſſion of the abdomen in going to ſtool, or making water. Hence the breathing is thick, ſhort, and ſuffocating, and performed only by the motion of the thorax. There is alſo a conſtant delirium, a drawing in of the hypochondria inwards and upwards, an involuntary laughter, convulſions, and madneſs.

This diſeaſe terminates as in a pleuriſy, but is attended with more violent ſymptoms, and is much more fatal. If the part affected ſuppurates, the matter will fall into the abdomen, and produce a purulent aſcites. See ASCITES.

The cure muſt be attempted in the ſame manner as a pleuriſy. See the article PLEURISY.

Emollient clyſters are often beneficial.

PARAPHROSYNE, a word uſed by medical writers to expreſs a delirium, or an alienation of mind in fevers, or from whatever cauſe.

PARAPLEGIA, or PARAPLEXIA, in medicine, a ſpecies of paralyſis, or palſy, uſually ſucceeding an apoplexy. See the article PALSY.

Boerhaave defines it an immobility of all the muſcles below the head, that have nerves from the cerebrum and cerebellum; ſometimes all ſenſe, as well as motion, are deſtroyed thereby, and ſometimes only one of them is loſt; hence the the paraplegia is a general palſy affecting the whole body, the head alone excepted.

PARAPLEXIA, the ſame with paraplegia. See the preceding article.

PARAPOTAMIA, in the materia medica of the antients, a word uſed at firſt as an epithet of diſtinction for a kind of œnanthe, from which the œnanthine ointment of the Greeks was made, but afterwards uſed ſimply as the name of that plant.

PARASANG, an antient perſian meaſure, different at different times, and in different places; being ſometimes thirty, ſometimes forty, and ſometimes fifty ſtadia, or furlongs.

PARASCEVE, the ſixth day of the laſt week of Lent, commonly called Good Friday.

PARASELENE, in phyſiology, a mock moon, a meteor, or phænomenon, encompaſſing, or adjacent to, the moon, in form of a luminous ring; wherein are ſometimes obſerved one, ſometimes two, apparent images of the moon.

The paraſelenes are formed after the ſame manner as the parhelia, or mock ſuns. See the article PARHELIUM.

PARASITE, παρασιτος, among the Greeks, was originally a very reputable title; the paraſites being a kind of prieſts, at leaſt miniſters, of the gods, in the ſame manner as the Epulones were at Rome. They took care of the ſacred corn, or the corn deſtined for the ſervice of the temples, and the gods, *viz.* ſacrifices, feaſts, &c. they had even the intendance over ſacrifices and took care that they were duly performed. At Athens, there was a kind of college of twelve paraſites; each people of Attica furniſhing one, who was always choſen out of the beſt families. Polybius adds, that a paraſite was alſo an honourable title among the antient Gauls, and was given to their poets; but of late it has been made a term of reproach, and uſed for a flatterer, and mean dependant.

PARASITES, or PARASITICAL PLANTS, in botany, ſuch plants as are produced out of the trunk or branches of other plants, from whence they receive their nouriſhment,

nouriſhment, and will not grow upon the ground, as the miſleto, &c.

PARASOL, a little moveable, in manner of a canopy, borne in the hand, to ſcreen the head from the ſun, rain, &c. more uſually called umbrella. It is made of leather, taffety, oil-cloth, &c. mounted on a ſtick, and opened or ſhut at pleaſure, by means of pieces of whalebone that ſuſtain it.

PARASTATA, in the antient architecture, an impoſt, or kind of anta, or pilaſter, built for the ſupport of an arch; or as ſome will have it, pilaſters, which ſtand alone, not adjoining to the wall. Daviler makes a paraſtata the ſame with impoſt, but Evelyn the ſame with pilaſter.

PARASTATÆ, or EPIDIDYMIDES, in anatomy, two tuberous varicoſe bodies, lying upon, and adhering to, the upper part of the teſticles, whereof they properly appear to be a part, though different from the reſt in form and conſiſtence.

The paraſtatæ are oblong, nearly of a cylindric figure, reſembling in ſome meaſure the body of a caterpillar, or ſilkworm. They are connected with the teſticle by means of the tunica albuginea, and alſo with the vas deferens. Their origin is in the teſticles, by five or ſix very ſmall ſeminal veſſels, and their termination is in the other extremity of the teſticle, where the vas deferens begins. They are ſurrounded by a robuſt membrane, which is continuous with the albuginea of the teſticle; they are compoſed of veſſels in the ſame manner as the teſticles, which are capable of being elegantly filled with injections. All theſe veſſels terminate in one duct at laſt, and this duct is called the vas deferens: the veſſels they are compoſed of are much more conſpicuous than thoſe which form the teſticles: their blood-veſſels being the ſame with thoſe of the teſticles, are called ſpermatics; their nerves proceed from the ſame branches with thoſe of the teſticles; their uſe is to receive the ſemen from the teſticles, to farther elaborate and perfect it, and finally to convey it into the vas deferens. See the article DEFERENTIA VASA, &c.

PARASYNANCHE, in medicine, a kind of angina, or quinzy, wherein the exterior muſcles of the throat are inflamed. See the article QUINZY.

PARATHENAR, in anatomy, the name of two muſcles of the foot; one of which, the parathenar major, is a pretty long muſcle, forming a part of the outer edge of the ſole of the foot. It is fixed backward by a fleſhy body to the outer part of the lower ſide of the os calcis, from the ſmall poſterior external tuberoſity all the way to the anterior tuberoſity: there it joins the metatarſus, and at the baſis of the fifth metatarſal bone ſeparates from it again, and forms a tendon which is inſerted in the outſide of the firſt phalanx of the little toe, near its baſis, and near the inſertion of the other parathenar: this laſt is called the parathenar minor; being a fleſhy muſcle fixed along the poſterior half of the fifth bone of the metatarſus, and terminating under the head of that bone in a tendon which is inſerted in the lower part of the baſis of the firſt phalanx of the little toe.

PARATHESIS, in grammar, the ſame with appoſition. See APPOSITION.

PARATHESIS, is alſo the ſame with parentheſis. See PARENTHESIS.

PARATHESIS, in the greek church, the prayer which the biſhop rehearſes over the catechumens, ſtretching his hand over them to give them benediction, which they receive bowing their heads under his hands.

PARATITLES, *paratitla*, in juriſprudence, ſhort notes or ſummaries of the titles of the digeſt and code; which have been made by ſeveral lawyers, in order to compare and examine the connection of the ſeveral parts with one another. See DIGEST and CODE.

PARAVAIL, or PARAVAILE, ſignifies a perſon that is tenant to one who holds of another, or the loweſt tenant of the fee.

PARAZONIUM, or SCIPIO, among medaliſts, a ſceptre, rounded at the two ends in manner of a truncheon, or commander's ſtaff; or a kind of poniard or ſhort ſword, repreſented as worn at the girdle on ſeveral antient medals.

Antiquaries are much divided on the explication of the parazonium, on account that the form and manner of bearing it are very different. It is ſometimes thrown acroſs the ſhoulders in manner of a quiver.

PARBOILING, in pharmacy, &c. a term applied to fruits, herbs, &c. which are boiled a little while, to draw out the firſt juices, in order to be afterwards inſpiſſated or thickened. See BOILING.

PARBUNCLE, in a ſhip, the name of a rope almoſt like a pair of ſlings: it is ſeized both ends together, and then put double

double about any heavy thing that is to be hoiſted in or out of the ſhip; having the hook of the runner hitched into it, to hoiſe it up by.

PARCÆ, in the heathen mythology, goddeſſes, who were ſuppoſed to preſide over the accidents and events, and to determine the date or period, of human life.

The antients reckoned the parcæ, who were alſo called fates and deſtinies, to be three in number, becauſe all things have their beginning, progreſs and end. They were called Atropos, Clotho, and Lacheſis, and are repreſented as ſpinning the thread of human life, in which employment Clotho held the diſtaff. Lacheſis turned the wheel, and Atropos cut the thread. Their perſons are variouſly deſcribed; ſometimes they are repreſented as old women, one holding a diſtaff, another a wheel, and a third a pair of ſciſſars. Others paint Clotho in a robe of divers colours, with a crown of ſtars upon her head, and holding a diſtaff in her hand; Lacheſis in a garment covered with ſtars, and holding ſeveral ſpindles; and Atropos they clad in black, cutting the thread with a large pair of ſciſſars.

PARCEL-MAKERS, two officers in the exchequer, who make parcels of the eſcheator's accounts, in which they charge them with every thing they have levied for the king's uſe, within the time of their office, and deliver the ſame to one of the auditors of the court, to make their accounts therewith.

PARCHMENT, in commerce, the ſkins of ſheep or goats prepared after ſuch a manner as to render it proper for writing upon, covering books, &c.

The manufacture of parchment is begun by the ſkinner, and finiſhed by the parchment-maker.

The ſkin having been ſtripped of its wool, and placed in the lime-pit, in the manner deſcribed under the article SHAMMY, the ſkinner ſtretches it on a kind of frame, and pares off the fleſh with an iron inſtrument; this done, it is moiſtened with a rag, and powdered chalk being ſpread over it, the ſkinner takes a large pumice-ſtone, flat at bottom, and rubs over the ſkin, and thus ſcowers off the fleſh; he then goes over it again with the iron inſtrument, moiſtens it as before, and rubs it again with the pumice-ſtone without any chalk underneath: this ſmooths and ſoftens the fleſh ſide very conſiderably. He then drains it again, by paſſing over it the iron inſtrument as before. The fleſh ſide being thus drained, by ſcraping off the moiſture, he in the ſame manner paſſes the iron over the wool or hair-ſide: then ſtretches it tight on a frame, and ſcrapes the fleſh-ſide again: this finiſhes its draining; and the more it is drained, the whiter it becomes. The ſkinner now throws on more chalk, ſweeping it over with a piece of lamb-ſkin that has the wool on, and this ſmooths it ſtill farther. It is now left to dry, and when dried, taken off the frame by cutting it all round. The ſkin thus far prepared by the ſkinner, is taken out of his hands by the parchment-maker, who firſt, while it is dry, pares it on a ſummer, (which is a calf ſkin ſtretched in a frame) with a ſharper inſtrument than that uſed by the ſkinner, and working with the arm from the top to the bottom of the ſkin, takes away about one half of its thickneſs. The ſkin thus equally pared on the fleſh ſide, is again rendered ſmooth, by being rubbed with the pumice ſtone, on a bench covered with a ſack ſtuffed with flocks, which leaves the parchment in a condition fit for writing upon. The parings thus taken off the leather, are uſed in making glue, ſize, &c. See the article GLUE, &c.

What is called vellum, is only parchment made of the ſkins of abortives, or at leaſt ſucking calves. This has a much finer grain, and is whiter and ſmoother than parchment; but is prepared in the ſame manner, except its not being paſſed through the lime-pit.

Parchment on being imported, pays a duty of 1l. 5s. $\frac{64\frac{1}{2}}{100}$d. for every roll, containing ſix dozen, of which 9s. $\frac{67\frac{1}{2}}{100}$d. is drawn back on exportation.

PARCO FRACTO, in law, is a writ which lies againſt a perſon that breaks any pound, and takes out from thence beaſts lawfully impounded. On this writ damages are recoverable, and the party offending may be puniſhed, as for a pound-breach in the court-leet.

PARDALUS, or PARDUS, the leopard. See the article LEOPARD.

PARDO, a fine palace belonging to the king of Spain, with a fine park and gardens, about ſix miles north-weſt of Madrid.

PARDON, in law, is the forgiveneſs of an

an offence againſt the king or the laws. A pardon may be granted either before attainder or conviction, or afterwards, and they are alſo ſometimes granted upon conditions, on the performance of which the validity of the pardon depends. Pardons are general, and either by act of parliament, or by the king's charter granted upon ſome public occaſion, as a coronation, &c. or particular, when granted by the king to particular perſons. As to a general pardon, it not only diſcharges the puniſhment to which the offender was liable, but alſo the guilt of the crime itſelf; and ſome lawyers maintain, that it pardons the crime ſo fully, that the offender in the eye of the law is deemed as innocent as if he had never committed it. For this reaſon, after the pardon, a perſon, on being called felon or traitor, may have an action for ſcandal; and he may be a good witneſs, notwithſtanding his conviction or attainder, becauſe the pardon makes ſuch a perſon a new man, and gives him freſh credit. But though a general pardon extends to public offences againſt the commonwealth, it does not extend to private injuries committed againſt particular perſons, and therefore, he that would reap the benefit of ſuch a pardon muſt plead the ſtatute, &c. by which it was granted, in order that the court may judge whether his offence be included within the ſtatute or not; likewiſe where there is an exception in the pardon, he muſt ſhew that he is not the perſon excepted againſt. Neither can the king's charter of pardon be allowed, unleſs it be pleaded and produced in court; where the party at the bar muſt, upon his knees, pray the allowance of it. No pardon of felony, &c. can paſs without warrant of the privy ſeal, and thoſe who have been guilty of felony, notwithſtanding their pardon, are to enter into a recognizance with two ſufficient ſureties for their good behaviour for ſeven years. In what caſes, on the diſcovery of accomplices, pardons are allowed by ſtatute may be ſeen in 4 and 5 William and Mary, and 11 William III.

PAREGORICS, in pharmacy, medicines that aſſuage pain, otherwiſe called anodynes. See the article ANODYNE.

PAREIRA BRAVA, in the materia medica, a kind of oblong, and large root, brought from the Braſils; but the plant, to which it belongs, is not known. It is certainly a diuretic of no mean character, and has done great ſervice in nephritic caſes, and in pleuriſies and quinſies it has been attended with more ſucceſs than almoſt any medicine we know of ſingly. In ſuppreſſions of urine, ſcarce any thing is more efficacious or more inſtantaneous in its effects; but it is a folly to infer from this, that it will diſſolve the ſtone. This medicine diſſolves the mucous humour that ſtops up the paſſages of the kidnies, &c. and expels all the ſtony matter not yet formed into large and hard maſſes. And in caſes of ulceration of the kidnies and bladder, after the uſe of this remedy, the urine flows copiouſly and becomes more limpid, and the ulcerations are ſoon healed upon giving a little balſam capivi mixed with it.

Geoffroy, who highly commends the pareira brava, adds that in humoral aſthmas ariſing from a glutinous phlegm obſtructing the bronchia, after all other methods tried in vain, this root has promoted an expectoration; and the ſame ſucceſs he has had with it in a jaundice ariſing from a thick and grumous ſtate of the bile; he alſo recommends it greatly in gonorrhœas, mixed with balſam capivi, given in powder and made into a bolus; or, with that and calomel, with ſome thick ſyrup. Two drachms of it will ſerve for a decoction to be taken at about three doſes.

Beſides the true pareira brava, there is another called the pareira brava alba; it is ſaid, by the Portugueſe, to poſſeſs the ſame virtues with the former, but in a more remiſs degree.

PARELCON, in grammar, a figure by which a word or ſyllable is added to the end of another.

PARELIUM, or PARHELIUM. See the article PARHELIUM.

PAREMBOLE, Παρεμβολη, in rhetoric, a figure wherein ſomething relating to the ſubject is inſerted in the middle of a period. All the differences between the parembole and parentheſis, according to Voſſius, is, that the former relates to the ſubject in hand, whereas the latter is foreign to it. An example of each we have in Virgil; and firſt of the parembole.

Æneas (neque enim patrius conſiſtere mentem
Paſſus amor) rapidum ad naves præmittit Achatem.

The

The following is an inſtance of the parentheſis:

———*ipſique ſuos jam morte ſub ægrâ*
(Di meliora piis, erroremque hoſtibus illum)
Diſciſſos nudis laniabant dentibus artus.

See the article PARENTHESIS.

PARENCHYMA, in anatomy, a term introduced by Eraſiſtratus, ſignifying all that ſubſtance which is contained in the interſtices betwixt the blood-veſſels of the viſcera, which he imagined to be extravaſated and concreted blood. The moderns having diſcovered all the viſcera to be vaſcular and glandulous, have rejected this term, together with the doctrine.

PARENCHYMA *of plants.* Grew applies the term parenchyma to the pith or pulp, or that inner part of a fruit or plant through which the juice is ſuppoſed to be diſtributed. This, when viewed with a microſcope, appears to reſemble marrow, or rather a ſponge, being a porous, flexible, dilatable ſubſtance. Its pores are innumerable and exceedingly ſmall, receiving as much humour as is requiſite to fill and extend them, which diſpoſition of pores it is that is ſuppoſed to fit the plant for vegetation and growth.

PARENT, *parens*, a term of relation applicable to thoſe from whom we immediately receive our being. See the articles FATHER and MOTHER.

Parents, by the law of nature, are bound to educate, maintain, and defend their children, over whom they have power by that law: they likewiſe have intereſt in the profits of their children's labour, during their nonage, in caſe the children live with and are provided for by them: yet the parent has no intereſt in the real or perſonal eſtate of a child, any otherwiſe than as his guardian.

PARENTALIA, in antiquity, funeral obſequies, or the laſt duties paid by children to their deceaſed parents.

It is alſo uſed for a ſacrifice, or ſolemn ſervice, offered annually to the manes of the dead.

PARENTELA. De parentela ſe tollere, was antiently uſed among us to denote a perſon's renouncing his kindred or family.

This was performed in open court before the judge, in the preſence of twelve men, who made oath that they believed it was done on good grounds.

PARENTHESIS, in grammar, certain intercalary words, inſerted in a diſcourſe, which interrupt the ſenſe, or thread, but ſeem neceſſary for the better underſtanding of the ſubject.

The proper characteriſtic of a parentheſis is, that it may be either taken in or left out, the ſenſe and the grammar remaining intire. In ſpeaking, the parentheſis is to be pronounced in a different tone; and in writing, it is encloſed between (), called alſo a parentheſis, but commonly a bracket, or crochet, to diſtinguiſh it from the reſt of the diſcourſe. The politeſt of our modern writers avoid all parentheſes, as keeping the mind in ſuſpenſe, embaraſſing it, and rendering the diſcourſe leſs clear, uniform, and agreeable.

The parentheſis is frequently confounded with the parembole. See the article PAREMBOLE.

PARENZO, or PIRENZO, a port-town of Iſtria, in the territory of Venice, ſituated on a bay of the gulph of Venice, twenty-five miles ſouth of Cabo de Iſtria.

PARERGA, παρεργα, a term ſometimes uſed in architecture for additions or appendages made, by way of ornament, to a principal work.

It is ſometimes uſed in painting for little pieces or compartiments, on the ſides or in the corners of the principal piece.

PARESIS, παρεσις, in medicine, is defined to be a palſy of the bladder, wherein the urine is either ſuppreſſed or diſcharged involuntarily. See PALSY.

PARETONIUM, in natural hiſtory, the name of an earth antiently found on the ſhores of Egypt, Cyrene, and the iſland of Crete, and uſed by the antients in painting. There has been ſome difference among the earlier writers about the nature and origin of this ſubſtance, and of late we have been taught to think it loſt; but it is ſtill common on the ſhores of moſt of the iſlands of the Archipelago, though not obſerved or regarded; and is truly a very heavy and tough clay, of a fine white colour, found in maſſes of different ſizes, generally as ſoft as the ſofter clays within the ſtrata; and by rolling about on the beech in this ſtate, it gathers up the ſand, ſmall ſhells, and other foulneſſes we always find about it. It is moſt probable, that there are ſtrata of it fine and pure in the cliffs there, and that the ſea waſhes off maſſes of them in ſtorms and high tides, which are what we find.

PARGET, in natural hiſtory, a name

given to ſeveral kinds of gypſum, or plaſter ſtone. See PLASTER.

PARGETING, in building, is uſed for the plaſtering of walls, and ſometimes for the plaſter itſelf.

Pargeting is of various kinds, as, 1. white-lime, hair, and mortar, laid upon bare walls: 2. on bare laths, as in partitioning and ceiling: 3. rendering the inſides of walls, or doubling partition-walls: 4. rough-caſting upon heart-laths: 5. plaſtering on brick-work, with a finiſhing mortar, in imitation of ſtone-work.

PARHELIUM, or PARHELION, in phyſiology, a mock ſun, or meteor, in form of a very bright light, appearing on one ſide of the ſun.

The parhelia are formed by the reflection of the ſun's beams on a cloud properly poſited. They uſually accompany the coronæ, or luminous circles, and are placed in the ſame circumference and at the ſame height. Their colours reſemble that of the rainbow, the red and yellow are on the ſide towards the ſun, and the blue and violet on the other. There are coronæ ſometimes ſeen without parhelia, and *vice verſa*.

Parhelia are double, triple, &c. and in 1629, a parhelion of five ſuns was ſeen at Rome; and in 1666, another at Arles of ſix.

M. Mariotte accounts for parhelia from an infinity of little particles of ice floating in the air, that multiply the image of the ſun by refraction or reflection; and by a geometrical calculus he has determined the preciſe figure of theſe little icicles, their ſituation in the air, and the ſize of the coronæ of circles which accompany the parhelia, and the colours wherewith they are painted. M. Huygens accounts for the formation of a parhelion in the ſame manner as for that of the halo. See the article HALO.

PARIA, a lake of Peru, in ſouth America, in the province of Los Charcas, ſituated in 67° weſt long. and 22° ſouth lat.

PARIA, or NEW-ANDALUSIA, a country of Terra-Firma, in ſouth-America, having the Atlantic-Ocean on the north; the country of Guiana, from which it is ſeparated by the river Oronoque, on the eaſt; and Venezuela on the weſt.

PARIAN MARBLE. See MARBLE.

PARIETALIA OSSA, in anatomy, the ſecond and third bones of the cranium; being called alſo oſſa-bregmatis, and oſſa-ſincipitis.

Theſe bones are of a larger extent than any of the other bones of the ſkull: their figure is nearly that of an irregular convex ſquare; they have each an external convex ſide, and an internal and concave one; four edges, one ſuperior or ſagittal, one inferior or temporal, one anterior or frontal, and one poſterior or occipital. In the external ſurface of the parietals, is the place of part of the temporal muſcle or crotophytes. In their internal ſurface are furrows repreſenting little ſhrubs; theſe are formed by the arteries of the dura mater: beſides theſe there are other foveæ.

PARIETES, in anatomy, a term uſed for the incloſures, or membranes, that ſtop up or cloſe the hollow parts of the body, eſpecially thoſe of the heart, thorax, &c.

PARIETARIA, PELLITORY OF THE WALL, in botany, a genus of the polygamia-monoecia claſs of plants, having no corolla: the ſtamina are four ſubulated filaments; the antheræ are didymous; there is no pericarpium; the perianthium is elongated, very large, and campanulated; the ſeed is ſingle and roundiſh. This plant is very famous in the materia medica, as cooling and abſtergent. It is preſcribed in ſtranguries, and in caſes of gravel, or ſmall ſtones in the kidneys, and is an ingredient in decoctions for clyſters to be given in nephritic caſes. Externally, it is much recommended in the eryſipelas, and for the ſoftening of hard tumours.

PARIS, HERB TRUE-LOVE, in botany, a genus of the octandria-trigynia claſs of plants, the corolla whereof conſiſts of four oblong, plane, patent petals; the fruit is a berry of a globoſe, tetragonal form, containing four cells, and ſtanding in the cup: the ſeeds are numerous, and arranged in a double ſeries.

PARIS, in geography, the metropolis of the kingdom of France, and of the principality or government of the iſle of France, ſituated in eaſt long. 2° 25′, north lat. 48° 50′, two hundred miles ſouth-eaſt of London, ſix hundred and eighty north-eaſt of Madrid, five hundred and fifty weſt of Vienna, one thouſand three hundred north-weſt of Conſtantinople, and ſeven hundred north-weſt of Rome.

Paris is uſually divided into three parts: 1. the town, which is the largeſt, ſituated on

on the north ſide of the river Seyne: 2. the city, much the leaſt, but the moſt antient, conſiſting of three little iſlands in the middle of the Seyne: 3. the univerſity, which lies on the ſouth ſide of the river. The whole town is of a circular form, ſix leagues in circumference, and the diameter three, and containing ſeven hundred thouſand inhabitants.

PARISH, the precinct of a parochial church, or a circuit of ground inhabited by people who belong to one church, and are under the particular charge of its miniſter.

A pariſh may contain ſeveral villages within its limits, though in general it is accounted to contain no more than one, except the contrary be made to appear: and an antient village, which time out of mind has had a church of its own, and choſen overſeers, *&c.* may be a pariſh in reputation, ſo as to provide for its own poor only, and be excuſed from contributing to the poor of the pariſh in which it lies, 43 Eliz. c. 2.

In England there are nine thouſand, nine hundred and thirteen pariſhes, of which three thouſand, eight hundred and forty-five are churches impropriate, and the reſt are annexed to colleges, or church dignities. In many of theſe pariſhes, on account of their large extent, and the number of pariſhioners, there are ſeveral chapels of eaſe.

PARISH-OFFICERS, officers choſen annually to regulate and manage the concerns of the pariſh, for which ſee the articles CHURCH-WARDENS and OVERSEERS *of the poor*.

PARISIS, an epithet formerly given to the money ſtruck at Paris, to diſtinguiſh it from the coin called tournois, which was at the ſame time ſtruck at Tours. The pariſis exceeded the tournois by one fourth, ſo that the ſol pariſis was worth fifteen deniers, and the ſol-tournois but twelve.

PARK, a large incloſure privileged for wild beaſts of chace, either by preſcription or the king's grant. No perſon can now erect a park without his obtaining firſt a licence under the broad-ſeal; but there may be ſuch in reputation, though erected without lawful warrant, and the owner may bring his action againſt perſons that kill his deer therein. The pulling down walls, or pales, makes the offenders liable to the ſame penalty as for killing of deer.

PARK, is alſo uſed for a moveable incloſure, or fold, ſet up in the fields for ſheep to feed and reſt in during the night. This park is frequently removed by the ſhepherds to dung the ground one part after another.

PARK, alſo ſignifies a large net, placed on the brink of the ſea, with only one entrance, which is next the ſhore, and which is left dry by the ebb of the tide; ſo that the fiſh once got in have no way left to eſcape.

PARK *of artillery*. See the article ARTILLERY PARK.

PARK-ABBY, a place near Louvain, in the Netherlands, which being an excellent ſituation for a camp, was frequently poſſeſſed by the armies in the late war.

PARKINSONIA, in botany, a genus of the decandria monogynia claſs of plants, the corolla of which conſiſts of five petals, nearly equal in ſize: the fruit is an oblong legume, nodoſe at the ſeeds, and acuminated: the ſeeds are numerous.

PARLEY, a conference with an enemy. Hence to beat or ſound a parley, is to give a ſignal for holding ſuch a conference by beat of drum or ſound of trumpet.

PARLIAMENT, is the grand aſſembly of the three ſtates of this kingdom, ſummoned together, by the king's authority, to conſult of matters relating to the public welfare, and particularly to enact and repeal laws. It conſiſts of the king, the lords ſpiritual and temporal, and the commons, and is at once the ſeat of the legiſlative authority, and the higheſt court of juſtice in Great-Britain. In the houſe of lords, criminal cauſes are tried on the impeachment of the commons; and this houſe has an original juriſdiction for the trial of peers upon indictments found by a grand jury; the lords likewiſe try ſuch cauſes as come thither on appeals from the court of chancery, and all their decrees are as judgments. The houſe of commons examine the right of elections, regulate diſputes concerning them, may expel their own members, and commit them to priſon; they are the grand inqueſt of the nation, and preſent public grievances or delinquents to the king and lords, in order to their being puniſhed. In ſhort, they are the repreſentatives of all the commons in the kingdom, and in them their conſtituents have placed the higheſt confidence, by inveſting them with the power of making laws, and entruſting them with all their liberties and privileges. Originally, new parliaments were called

every year; but by degrees their term grew longer. In the reign of king Charles II. they were held a long time, with great interruptions between: but both methods were found of ſuch ill conſequence, that, in the beginning of the reign of king William III. an act was paſſed, by which the term of all parliaments was reſtrained to three ſeſſions, or three years; this was hence called the triennial act: but ſince that time, from other views, the period of parliaments has been lengthened to ſeven years. A parliament is called by the king's writ or letter directed to each lord, commanding him to appear; and by other writs, directed to the ſheriffs of each county, to ſummon the people to elect two knights for each county, and one or two burgeſſes for each borough. The number of the members in the houſe of lords is uncertain, as encreaſing at the king's pleaſure. The members of the houſe of commons, when full, are five hundred and fifty-three; *viz.* ninety-two knights of the ſhires; fifty-two deputies for twenty-five cities, London having four; ſixteen for the eight cinque-ports; two for each univerſity; three hundred and thirty-two for an hundred and eighty boroughs; twelve for the boroughs in Wales, and forty-five members for Scotland. If three hundred of theſe members are met, it is reckoned a full houſe; and forty may compoſe a houſe for the diſpatch of buſineſs.

Upon the holding of a parliament, the king, the firſt day, ſits in the upper-houſe, under a canopy, with the crown on his head, and dreſſed in his royal robes; and there, by himſelf, or the lord chancellor, declares the reaſons of their meeting, in the preſence of both the lords and commons, and then the commons are required to chooſe a ſpeaker, who is preſented to the king, and being approved by his majeſty, the buſineſs of the parliament goes on.

The lords and commons ſit each in a diſtinct apartment: in the houſe of lords, the princes of the blood ſit by themſelves on the ſides of the throne; at the wall, on the king's right hand, the two archbiſhops ſit by themſelves on a form. Below them, the biſhops of London, Durham and Wincheſter, and all the other biſhops ſit according to the priority of their conſecretion. On the king's left hand, the lord-treaſurer, lord preſident, and lord-privy-ſeal ſit upon forms above all dukes, except the royal blood; then the dukes, marquiſſes, and earls, according to their creation. Acroſs the room are wool-ſacks, continued from an antient cuſtom; and the chancellor, or keeper, being of courſe the ſpeaker of the houſe of lords, ſits on the firſt wool-ſack before the throne, with the great ſeal or mace lying by him; below theſe are forms for the viſcounts and barons. On the other wool-ſacks are ſeated the judges, maſters in chancery, and king's council, who are only to give their advice in points of law: but they all ſtand up till the king gives them leave to ſit. The commons ſit promiſcuouſly, only the ſpeaker has a chair at the upper end of the houſe, and the clerk and his aſſiſtant ſit at a table near him. Before any buſineſs is done, all the members of the houſe of commons take the oaths of allegiance and ſupremacy, *&c.* and ſubſcribe their opinions againſt tranſubſtantiation, *&c.* and if any member of that houſe votes, or ſits there during any debate, after the ſpeaker is choſen, without having firſt taken theſe oaths, between the hours of nine and four, in a full houſe, he is adjudged a popiſh recuſant convict, and incapable of any office, and forfeits five hundred pounds. The ſame teſt the lords too, though they do not take the oaths, are obliged to comply with. When the parliament is thus met, no members are to depart from it without leave. Upon extraordinary occaſions, all the members are ſometimes ſummoned, in which caſe every lord ſpiritual and temporal, and every knight, citizen, and burgeſs is to come to parliament, except he can reaſonably and honeſtly excuſe himſelf; or be amerced: that is, reſpectively, a lord by the lords, and a commoner by the commons.

All members of parliament, in order that they may attend the public ſervice of their country, have the privilege for themſelves and their menial ſervants, of being free from arreſts, attachments, impriſonments, *&c.* for debts, treſpaſſes, *&c.* but not from arreſts for treaſon, felony, and breach of the peace: however, it is ordained by ſtatute, that actions may be commenced, in any of the courts of Weſtminſter, againſt perſons intitled to privilege of parliament, after a prorogation or diſſolution, till a new parliament is called, or the ſame become re-aſſembled; and likewiſe after an adjournment for above fourteen days; and the reſpective courts, in ſuch a caſe, have power to proceed

proceed to judgment, &c. here the proceſs is to be ſummons, diſtreſs infinite, &c. till the parties ſhall enter an appearance; and for default thereof, the real or perſonal eſtate of the defendant may be ſequeſtered; though the plaintiff may not, in that caſe, arreſt the body of any member of parliament: 12 W. III. c. 3. As to the election of members, it is enacted that candidates ſhall not make any preſents of money to, or treat the electors, after the teſte of the writ of the ſummons, or the iſſuing out of the writs for elections, or after any ſeat for a member of parliament is become vacant; in caſe they do, they are declared incapable of ſerving as members, by 7 W. III. c. 4. And farther, an oath is to be taken by electors, that they have not either received, or had any money, gift, reward, or any office, place, employment, or even promiſe of money, gift, &c. to them or their uſe, to give their votes; and in theſe caſes, if they aſk, take, or contract for money or reward, either by gift or other device, to give or refuſe their votes for any one; or if perſons, by gift, &c. corruptly procure any elector to give his vote, they ſhall forfeit five hundred pounds, and be totally diſabled to vote at any election of members of parliament, as alſo to hold any office, franchiſe, &c. Likewiſe officers who admit perſons to vote without their taking the aforementioned oath, in caſe the ſame be demanded, incur a forfeiture of one hundred pounds; and an oath is to be adminiſtred to all the returning officers, that they have not received any money, gift, or place, for the making of their returns: 2 Geo. II. c. 24. 9 Geo. II. c. 38. A knight of the ſhire muſt be worth ſix hundred pounds a year in land, and all other members three hundred pounds.

Antiently all the people had votes in elections, till it was enacted by Henry VI. that none but freeholders, who had a yearly revenue of forty ſhillings, ſhould be admitted to vote for knights of the ſhire.

The manner of debating upon, and paſſing bills in parliament, is as follows: any member may move to have a bill brought in, which, upon a queſtion put, being agreed to by the majority, this perſon, with others, is ordered to prepare and bring in the ſame. When it is ready, a time is appointed for its being read, and after the clerk's reading it, the ſpeaker reads an abſtract of it, and puts the queſtion whether or no it ſhall have a ſecond reading? and after a ſecond reading, the queſtion is put, whether or no it ſhall be committed? which is either to a committee of the whole houſe, if it be of importance, or to a private committee, any member naming the perſons. The committee being appointed, and a chairman choſen, the chairman reads the bill paragraph by paragraph, puts every clauſe to the queſtion, fills up the blanks and makes amendments, according to the opinion of the majority. The bill thus gone through, the chairman makes his report at the ſide-bar of the houſe, reads all the additions and amendments, &c. and moves for leave to bring up the report to the table; which granted, he delivers it to the clerk, who reads the amendments, &c. The ſpeaker then puts the queſtion whether they ſhall be read a ſecond time; and, if agreed to, he reads them himſelf. To ſo many of the amendments as the houſe acquieſces in, the queſtion is now put, whether the bill, thus amended, ſhall be ingroſſed and written fair upon parchment, and read a third time? and the bill being ingroſſed, the ſpeaker holds it in his hand, and aſks if it ſhall paſs? If the majority be for it, the clerk writes on it, *Soit baillé aux ſeigneurs*, let it be delivered to the lords: or, if in the houſe of lords, *Soit baillé aux communes*, let it be delivered to the commons. If a bill be rejected, it cannot be any more propoſed during that ſeſſion. A bill for a general pardon has but one reading.

When a member of the houſe of commons ſpeaks, he ſtands up uncovered, and directs his ſpeech to the ſpeaker only. If what he ſays be anſwered by another, he is not allowed to reply the ſame day, unleſs perſonal reflections have been caſt upon him: but when the commons, in order to have a greater freedom of debate, have reſolved themſelves into a committee of the whole houſe, every member may ſpeak to a queſtion as often as he thinks neceſſary. In the houſe of lords they vote, beginning at the puiſne, or loweſt baron, and ſo up orderly to the higheſt, every one anſwering *content* or *not content*. In the houſe of commons they vote by *yeas* and *nays*; and if it be dubious which are the greater number, the houſe divides. If the queſtion be about bringing any thing into the houſe, the *yeas* go out; but if it be about any thing

thing the houſe already has, the *nays* go out. In all diviſions the ſpeaker appoints four tellers, two of each opinion. In a committee of the whole houſe, they divide by changing ſides, the *yeas* taking the right and the *nays* the left of the chair; and then there are but two tellers. If a bill paſs one houſe, and the other demur to it, a conference is demanded in the painted chamber, where certain members are deputed from each houſe; and here the lords ſit covered, and the commons ſtand bare and debate the caſe. If they diſagree, the affair is null; but if they agree, this, with the other bills that have paſſed both houſes, is brought down to the king in the houſe of lords, who comes thither clothed in his royal robes; before him the clerk of the parliament reads the title of each bill, and as he reads, the clerk of the crown pronounces the royal aſſent or diſſent. If it be a public bill, the royal aſſent is given in theſe words, *Le roy le veut*, the king will have it ſo; if private, *Soit fait comme il eſt deſiré*, let the requeſt be complied with: if the king refuſes the bill, the anſwer is, *Le roy s'aviſera*, the king will think of it: and if it be a money-bill, the anſwer is, *Le roy remercie ſes loyaux ſujets, accepte leur benevolence, & auſſi le veut*; the king thanks his loyal ſubjects, accepts their benevolence, and therefore grants his conſent.

PARLIAMENTS *of France*, are ſovereign courts, eſtabliſhed by the king, finally to determine all diſputes between particular perſons, and to pronounce on appeals from ſentences given by inferior judges. There are ten of theſe parliaments in France, of which that of Paris is the chief, its privileges and juriſdiction being of the greateſt extent. It conſiſts of ſix chambers, *viz.* the grand chamber, where cauſes of audience are pleaded; and five chambers of inqueſt, where proceſſes are adjudged in writing. This parliament enjoys the privilege of verifying and regiſtering the king's arrets or edicts, without which thoſe edicts are of little or no value.

PARLIAMENT *of Sweden*, conſiſts of four eſtates, with the king at their head: theſe ſtates are, 1. the nobility and repreſentatives of the gentry, with whom the colonels, lieutenant-colonels, majors, and captains of every regiment ſit and vote. 2. The clergy, one of which body is elected from every rural deanery of ten pariſhes; who, with the biſhops and ſuperintendents, amount to about two hundred. 3. The burghers, elected by the magiſtrates and council of every corporation as their repreſentatives, of whom there are four for Stockholm, and two for every other town, amounting in the whole to about an hundred and fifty. 4. The peaſants, choſen by the peaſants out of every diſtrict; who chooſe one of their own rank, and not a gentleman, to repreſent them: theſe amount to about two hundred and fifty.

All theſe generally meet at Stockholm, and after the ſtate-affairs have been repreſented to them from the throne, they ſeparate, and ſit in four ſeveral chambers or houſes, in each of which affairs are carried on by a majority of votes; and every chamber has a negative in the paſſing any law.

PARLIAMENT is alſo ſometimes uſed for other aſſemblies beſides the ſtates of a kingdom: thus the aſſembly of ſome of our inns of court, called to conſult on their common affairs, is at this day called a parliament.

PARLOUR, a fair lower room, deſigned principally for the entertainment of company. See the article APARTMENT.

In nunneries, parlour, or parlair, is a little room or cloſet, where people talk to the nuns through a kind of grated window. Antiently there were parlours in the convents of monks, where the novices uſe to converſe together at the hours of recreation; but there were liſtening places over, from whence the ſuperiors could hear every thing that was ſaid.

PARMA, the capital of the dutchy of Parma, in Italy, ſixty miles north-eaſt of Genoa, is pleaſantly ſituated on a river to which it gives name: eaſt long. 11°, north lat. 44° 45′.

PARMA, among antiquarians, denotes a kind of buckler, of a round figure, big enough to cover the whole body.

PARNASSIA, in botany, a genus of the pentandria-tetragynia claſs of plants, the corolla whereof conſiſts of five roundiſh, emarginated, ſtriated, concave, patent petals; the fruit is a tetragono-oval capſule, formed of four valves, containing one cell, and having a quadruple receptacle affixed to the valves: the ſeeds are numerous and oblong.

PARNASSUS, a mountain of Greece, much celebrated by antient poets, ſituated near Caſtro in Livadia.

PARNAU,

PARNAU, or PERNOW, a city and port-town of Livonia, eighty miles north of Riga.

PAROCHIAL, ſomething belonging to a pariſh. See PARISH, CHURCH, &c.

PARODICAL *degrees of an equation*, in algebra, are the ſeveral regular terms in quadratic, cubic, biquadratic equations, &c. the indexes of whoſe powers aſcend or deſcend orderly in an arithmetical progreſs, as $x^3 + x^2 m + xr = s$, is a cubical equation, where no term is wanting, but having all its parodic degrees, the indexes of the terms regularly deſcending thus 3, 2, 1, 0.

PARODY, *παρωδία*, a popular maxim, adage, or proverb.

Parody is alſo a poetical pleaſantry, conſiſting in applying the verſes written on one ſubject, by way of ridicule to another; or in turning a ſerious work into a burleſque, by affecting to obſerve, as nearly as poſſible, the ſame rhymes, words, and cadences. It comes near to what ſome of our late writers call traveſty; and was firſt ſet on foot by the Greeks, from whom we borrow the name.

PAROL, or PAROLE, in law, is uſed for a plea in court: ſometimes this word is joined with the term leaſe; thus leaſe-parole denotes a leaſe by word of mouth, in order to diſtinguiſh it from a leaſe in writing.

PAROL-ARREST ſignifies an arreſt by word of mouth, where authoriſed to be made; as in the caſe of a breach of the peace, committed in a juſtice of the peace's preſence, he may thereon verbally order the offender to be arreſted.

PAROL-DEMURRER is ſaid to be a privilege allowed to an infant that is ſued in relation to lands, which came to him by deſcent, when the court will give judgment, that the ſuit ſhall remain or continue, until the infant arrives at full age, *viz.* twenty-one years. In this caſe, if on a parol-demurrer, the age is granted, the writ does not abate, but the plea is put without day, till the infant is of age, and then it is revived by a reſummons, &c. The plaintiff in an action cannot pray parol-demurrer, during the nonage of the infant-defendant, for it is grantable in favour of infants only.

PARONOMASIA, *παρονομασία*, in rhetoric, a pun; or a figure whereby words nearly alike in ſound, but of very different meanings, are affectedly or deſignedly uſed: thus Tully to Antony, *cum in gremio mimorum* mentem & mentum *deponeres*.

PARONYCHIA, WHITLOW, in medicine, an inflammatory and exceeding painful diſorder, which inveſts all the joints, and particularly the ends of the fingers; being generally much ſwelled with a beating or throbbing and intenſe heat. There is ſometimes little or no tumour obſerved, when the diſorder lies deep at, or in the bone; and ſometimes again the tumour, pain, and inflammation are extended from the finger, up to the elbow, or even to the ſhoulder, from the communication of the fingers with thoſe parts by the flexor-muſcles. In ſome conſtitutions this diſorder excites a raging fever with faintings, convulſions, deliriums, an abſceſs, or ſphacelus of the parts; and without timely aſſiſtance death itſelf. Heiſter diſtinguiſhes three ſpecies of the paronychia; the firſt is when only the integuments are affected, at the end of the finger, either in its back or fore-part, or near the nail; in which caſe the ſymptoms are not uſually very malignant, though the pain be extremely acute: the ſecond kind is when the periоſteum is inflamed or eroded, in which caſe the ſymptoms are more or leſs violent than the preceding, in proportion as that membrane is more or leſs violently affected: the third and worſt ſpecies of this diſorder is that inveſting the nervous involucra or coverings of the tendons, belonging to the flexor-muſcles of the fingers, or even the adjacent nerves or tendons themſelves; for in that caſe the diſorder often appears with the moſt excruciating pains, and a train of the moſt malignant ſymptoms.

The true and proximate cauſe of a paronychia, in our author's opinion, ought to be referred to an inflammation of the adjacent integuments, chiefly of the periоſteum, from an inſpiſſation of the blood, or an obſtruction of its ſmall veſſels: this inflammation may again proceed from an internal or external cauſe, acting ſeparately or combined; ſuch as an inſpiſſation or acrimony of the blood and lymph, induced by a tenſe fibre, and a heating regimen, or an abuſe of the non-naturals, joined with a contuſion, wound, puncture, or with the ſtimulus of a foreign body.

For the cure of a paronychia, Garengeot propoſes inciſion before any trial has been made with other remedies; but Heiſter, agreeably to the advice of Hippocrates,

pocrates, is of opinion, that the diſorder may be frequently diſperſed and removed by the uſe of diluent, diſcutient, and cooling remedies, without an inciſion. The moſt approved method for removing an inflammation and obſtruction in this manner, is to let the patient hold his finger, for ſeveral hours, in ſpirit of wine, highly rectified, and in which has been infuſed camphor or theriaca. See DISPERSION, DISCUTIENTS, *&c.*

But when there is already a ſuppuration actually formed, either before or under the uſe of theſe means, then an inciſion is the only remedy. In the firſt ſpecies of this diſorder, the ſurgeon, as ſoon as he perceives the matter to point, or form a little protuberance, ought to hold and preſs it betwixt the finger and thumb of his left hand, while he makes a longitudinal inciſion therein, with his right, by which means the matter being diſcharged, the finger will then heal almoſt of itſelf. In the ſecond ſpecies of the paronychia, an inciſion is to be made according to the preceding directions; only then more care is to be taken, that the knife penetrate to the bone: the inciſion being made, the blood ſhould be ſuffered to flow out a little while, either of itſelf, or elſe it ſhould be preſſed out: then the wound is to be dreſſed with dry lint, and diachylon-plaſter, with a compreſs dipped in warm ſpirit of wine, and retained on by a proper bandage: the wound is next to be treated like thoſe in which the bones are affected; *viz.* with eſſence of myrrh, amber, balſam of Peru, *&c.*

In the third and laſt kind of this diſorder, which our author confeſſes never occurred to his obſervation, the ſmall tumour is firſt to be opened, by making an inciſion longitudinally, down into the capſule of the tendon, which will diſcharge a kind of lymph, or reſum. If the internal ſinus of the paronychia is in the middle part, or ſecond joint of the finger, and is laid open ſo far by inciſion, in that caſe M. Petit adviſes to continue the inciſion even down for above a quarter of an inch into the hand: the dreſſings may be much the ſame as in the preceding caſe.

PAROS, one of the ſmalleſt iſlands of the Cyclades, famous for its marble, ſituated in eaſt long. 25° 30′, north lat. 36° 30′.

PAROTIDES, in anatomy, two very remarkable glands, ſituated one on each ſide, between the ear and the angle of the lower jaw, and often extending themſelves over a great part of the maſſeter. From each of theſe glands there runs a very large duct, about three fingers-breadth long, and of the thickneſs of a wheat-ſtraw, having a great number of roots: this duct, from Steno, the diſcoverer, is by ſome called ductus ſalivalus ſtenonius, by others ductus ſalivalus ſuperior. It paſſes over the maſſeter-muſcle, thro' the middle of the cheek, and there perforates the buccinator-muſcle, and the membrane of the mouth, near the ſecond or third of the dentes morales, and at this perforation it diſcharges a very large quantity of its proper fluid into the mouth. The parotides are among thoſe glands that ſerve for the ſecretion of the ſaliva. See the articles GLAND and SALIVA.

PAROTIDES is alſo the name of certain tumours or inflammations ariſing behind the ears, on the parotid glands.

Theſe tumours are very frequent after malignant and peſtilential fevers. Children are alſo very particularly liable to them. They are of the ſame nature, and are to be treated in like manner with the buboes. See the article BUBO.

PAROXYSM, in medicine, the ſevere fit of a diſeaſe, under which it grows higher, or exaſperates, as of the gout, *&c.*

It is alſo uſed for the acceſs or return of a diſeaſe that intermits, as an ague, *&c.*

PARRELS, in a ſhip, are frames made of trucks, ribs, and ropes, which having both their ends faſtened to the yards, are ſo contrived, as to go round about the maſts; that the yards, by their means, may go up and down upon the maſts: theſe alſo, with the breaſt-ropes, faſten the yards to the maſts.

PARRICIDE, *parricida* or *patricida*, ſtrictly ſignifies the murder or murderer of a father, as matricide does of a mother; yet this word is ordinarily taken in both ſenſes, and is alſo extended to the murder of any near relation, as huſband, wife, brother, ſiſter, child, grand-child, uncle, *&c.* and even to that of great or ſacred perſons, though no way allied in blood, as a king, *&c.*

PARROQUET, in ornithology, a ſubdiviſion of parrots. See the next article.

PARROT, *pſittacus*, a genus of birds, of the order of the accipitres, the characters of which are theſe; the beak is of a hooked or uncinated figure; and the toes are four on each foot, two forwards and two backwards.

There are three diviſions of this genus:

1. The large ſpecies, called macao, of which

which there are a great many very elegant ſpecies, particularly the erythrocyaneus. See ERYTHROCYANEUS.

2. The ſmaller kind, properly called parrots, make a very numerous and very beautiful tribe of birds.

3. The leſſer kind, commonly called paroquettes, are likewiſe very numerous and very beautiful birds.

PARRYING, in fencing, the action of warding off the blows aimed at one by another. See the article FENCING.

PARSLEY, *petroſelinum* or *apium*, in botany. See the article APIUM.

Parſley-ſeeds, whether in powder or decoction, is an excellent carminative, as is alſo its diſtilled oil.

Parſley-root is one of the five greater opening roots: it is attenuant, aperient, detergent, and diuretic; and is preſcribed in diet-drinks, in chronic caſes ariſing from obſtructions of the viſcera: and in any form, it is a powerful diuretic.

PARSNEP, *paſtinaca*, in botany, a genus of the pentandria-digynia claſs of plants, the univerſal flower of which is uniform, and the particular ones compoſed of five lanceolated petals, bending inwards; the fruit is compoſed of two large, flattiſh, marginated ſeeds.

The ſeeds of the wild parſnep are carminative, and therefore good in flatuſes and colics: they are alſo ſaid to be diuretic, aperient, and to promote the menſes.

PARSON, the rector or incumbent of a pariſh-church. See the articles CHURCH and CLERGY.

It is ſaid, there may be two ſeveral parſons in the ſame church, one of the one moiety, and one of the other, wherein a part of the church and town is allotted to each of them; and there may alſo be two clergymen, who make but one parſon in a church, where they are preſented by the ſame patron. Where a perſon is a complete parſon, made ſo by preſentation, inſtitution, and induction, he may ceaſe to be a parſon of the church divers ways, as by ceſſion, where he reſigns or is deprived, either for ſimony, nonconformity to the canons, adultery, &c. Parſons ought generally to abide on their rectories, and live in the parſonage-houſe, unleſs it be in caſes of ſickneſs, &c. they are prohibited to take farms or leaſes of land, on pain of 10 l. per month forfeiture; and may not buy to ſell again any merchandize, &c. which makes them liable to forfeit triple value.

PARSON IMPARSONEE'S, ſignifies one that is in poſſeſſion of a church, whether it be preſentative or impropriate, and with whom the church is then full.

Perſona impерſonata is a plea in the writ quare impedit, that the parſon is admited and inſtituted in the church, &c.

PARSONAGE, a rectory or pariſh-church, endowed with a houſe, glebe, lands, tithes, &c. for the maintenance of a miniſter, with cure of ſouls within ſuch pariſh. There may, notwithſtanding, be a parſonage without either glebe or tithes, but only annual payments inſtead thereof. As to the rights to the parſonage and church, they are of ſeveral natures; the right of the parſon concerns the poſſeſſion of it; that of the patron, his preſentation; and the ordinary, his inveſtiture, &c. but no charge can be laid thereon, without the conſent and agreement of all of them. If the parſon waſtes the inheritance of the church, by cutting down trees, &c. his patron may have a prohibition.

PART, *pars*, a portion of ſome whole, conſidered as divided or diviſible.

Part, according to Chauvinus, is uſually diſtinguiſhed into logical and phyſical. Logical part is that referring to ſome univerſal as its whole; in which ſenſe, the ſpecies are parts of a genus; and individuals, or ſingulars, are parts of the ſpecies. Phyſical part, is that which, tho' it enters the compoſition of a whole, may yet be conſidered apart, and under its own diſtinct idea; in which ſenſe, a continuum is ſaid to conſiſt of parts. It is controverted in the ſchools, whether the parts of a continuum, or phyſical whole, *e. gr.* water, do exiſt actually before the diviſion be made, or only potentially. Phyſical parts, again, are of two kinds, homogeneous and heterogeneous: the firſt are thoſe of the ſame denomination with the other; the ſecond, of a different one. See HOMOGENEOUS, &c.

Parts, again, are diſtinguiſhed into ſubjective, eſſential, and integrant. Subjective or potential part is the ſame with logical part, *viz.* that contained in ſome univerſal whole, not in act, but only in power; as man and horſe are in animal, Peter and Paul in man. Eſſential part is that whereby, with the concurrence of ſome other, an eſſential whole is conſtituted: thus, the body and ſoul are eſſential parts of man. Integrant or integral part, is that which is neceſſary to the integrity of the whole, as a head is of a man, &c.

Conſent of PARTS, in medicine. See the article CONSENT.

PART, in geometry and aſtronomy, is applied to the diviſion of lines and circles, &c.

Aliquot PART, and *Aliquant* PART, in arithmetic. See the article ALIQUOT and ALIQUANT.

Proportional PART, is a part or number agreeable and analogous to ſome other part or number; or a medium to find ſome number or part unknown, by proportion and equality of reaſon.

Similar PARTS, are thoſe which are to one another, as their wholes are to one another.

Organical PART. See ORGANICAL.

PART, in muſic, denotes a piece of the ſcore, or partition, written by itſelf, for the conveniency of the muſician; or it is one or more of the ſucceſſions of ſounds, which make the harmony, written apart. Or, the parts are the ſounds made by ſeveral perſons, ſinging or playing in concert.

Muſic in parts was unknown to the antients; they had but one part: all their harmony conſiſted in the ſucceſſion of notes, none in the conſonance.

There are four principal parts, the treble, baſs, tenor, and counter-tenor. Some compare the four parts in muſic to the four elements; the baſs, they ſay, repreſents the earth; the tenor, the water; counter-tenor, air; and treble, fire.

PARTS *of ſpeech*, in grammar, are all the ſorts of words which enter the compoſition of diſcourſe. See SPEECH.

The grammarians generally admit of eight parts of ſpeech, *viz.* noun, pronoun, verb, participle, adverb, prepoſition, interjection, and conjunction. See the articles NOUN, PRONOUN, &c.

PART *of fortune*, in the judicial aſtrology, is the lunar horoſcope, or the point wherein the moon is, at the time when the ſun is in the aſcending part of the eaſt. The ſun in the aſcendant, is ſuppoſed, according to this ſcience, to give life, and the moon diſpenſes the radical moiſture, and is one of the cauſes of fortune. In horoſcopes, the part of fortune is repreſented by a circle divided by a croſs. See the article HOROSCOPE.

PART, or DEPART, in the manege, a word uſed to ſignify the motion and action of a horſe, when put on at full ſpeed. From the horſe's parting to his ſtop, there are commonly two hundred paces of ground. To make your horſe part with a good grace, you muſt put your bridle three fingers lower, and preſs gently with your heels, or with the calves of your legs.

PARTENKIRK, a town of Germany, in the circle of Bavaria, ſituated forty miles ſouth-weſt of Munich.

PARTENAY, a town of France, in the province of Orleanois, and territory of Poictou, ſituated thirty miles weſt of Poictiers.

PARTERRE, in gardening, a level diviſion of ground, which, for the moſt part, faces the ſouth, and beſt front of an houſe; and is generally furniſhed with greens, flowers, &c.

There are ſeveral ſorts of parterres, as plain graſs with borders, and parterres of embroidery, &c. Plain parterres are more beautiful in England than in any other country, by reaſon of the excellency of our turf, and that decency and unaffected ſimplicity that it affords to the eye of the ſpectator. Other parterres are cut into ſhell and ſcroll-work, with ſand-alleys between them; which ſort of parterres are eſteemed fineſt in France. As to the general proportions of parterres, an oblong or long ſquare is eſteemed the beſt: therefore a parterre ſhould not be leſs than twice as long as it is broad; twice and a half is accounted a very good proportion; and it is very rare that three times is exceeded. As to the breadth of a parterre, it is to take its dimenſions from the breadth of the front of the houſe; if the front of the houſe is one hundred feet long, the breadth of the parterre ſhould be one hundred and fifty feet; and if the front of the houſe be two hundred feet, the parterre ſhould be fifty feet broader: but where the front exceeds the breadth of this parterre, it will be a good proportion to make the parterre of the ſame dimenſions with the front. There ſhould be a terrace-walk on each ſide of the parterre, for an elevation proper for view; and, therefore, there ſhould never be the flat of a parterre between terrace-walk and terrace-walk above three hundred feet; nor can it be well made leſs than one hundred and forty. As to the adorning and furniſhing theſe parterres, whether it be plain or with embroidery, that depends much upon the form of them, and therefore muſt be left to the judgment and fancy of the deſigner.

PARTHENIUM, AMERICAN FEVERFEW, in botany, a genus of the monoecia-pen-

pentandria claſs of plants, the compound flower of which is convex; there are ſeveral corollulæ in the diſc, which are monopetalous, tubuloſe, ligulated, erect, quinquifid at the mouth, and of the length of the cup; the female flowers are alſo monopetalous, but they are tubulated, ligulated, oblique, obtuſe, roundiſh, and of the length of the hermaphrodite ones; they are five in number, and are placed in the verge or radius: there is no other fruit but the cup, which remains upon the plant unaltered: the ſeed in the hermaphrodite flowers is abortive; and in the female, it remains in the cup, and is ſingle, of a turbinato-cordated form, compreſſed, and naked.

The leaves and flowers of this plant are recommended in frigid and flatulent affections of the uterus, in obſtructions of the menſes, in venereal weakneſſes, and in the dropſy. They are alſo of great uſe in putrid fevers, the ſtone in the kidney, vertigo, and arthritis.

PARTHIA, a country of Aſia, formerly ſo called, ſituated almoſt in the middle of the modern Perſia.

PARTI, PARTIE, PARTY, or PARTED, in heraldry, is applied to a ſhield or eſcutcheon, denoting it divided or marked out into partitions. See SHIELD, *&c.*

The french heralds, from whom we borrow the word, have but one kind of parti, the ſame with our parti per pale, which they ſimply call parti: but with us the word is applied to all ſorts of partitioning, and is never uſed without ſome addition, to ſpecify the particular kind intended; thus we have parti or parted per croſs, per chief, per pale, per feſs, per bend dexter, per bend ſiniſter, per chevron, *&c.* See QUARTERING.

The humour of our anceſtors, Columbier obſerves, turning much upon exploits of arms and chivalry, they uſed to preſerve their battered and hacked armour as honourable ſymbols of their hardy deeds; and thoſe who had been in the hotteſt ſervice, were diſtinguiſhed by the moſt cuts and bruiſes that appeared on their ſhields. To perpetuate the memory hereof, ſays the ſame author, they cauſed them to be painted on their ſhields, and thus handed down to poſterity. And when heraldry grew into an art, and officers were appointed to direct the manner of bearing and blazoning, they gave names to thoſe cuts, anſwerable to the nature thereof, appointing four, from which all the others proceed; theſe are parti, called by our heralds parti per pale; couped, parti per feſs; tranche, parti per bend dexter; and taille, parti per bend ſiniſter. See COUPED, *&c.*

Parti per pale is when the ſhield is divided perpendicularly into two halves, by a cut in the middle from top to bottom. See plate CXCIII. fig. 3.

Parti per feſs is when the cut is acroſs the middle, from ſide to ſide.

Parti per bend dexter, is when the cut comes from the upper corner of the ſhield, on the right hand, and deſcends athwart to the oppoſite lower corner.

Parti per bend ſiniſter, is when the cut, coming from the upper left corner, deſcends acroſs to the oppoſite lower one.

From theſe four partitions have proceeded an infinite number of others, of various and extravagant forms.

PARTICIPATION, that which gives a part or ſhare in any thing, either by right or grace.

PARTICIPLE, *participium*, in grammar, an adjective formed of a verb, ſo called becauſe it participates partly of the properties of a noun, and partly of thoſe of a verb; being variable through genders and caſes, like the former; and regarding time, action, paſſion, *&c.* in manner of the latter. See the articles NOUN and VERB.

Thus the participle retains the attribute of the verb; and, moreover, the deſignation of the time or tenſe; there being participles of the preſent, the præterite, and future, eſpecially in Greek: but this is not always obſerved, the ſame participle being frequently joined with all ſorts of tenſes. There are active and paſſive participles; the active, in latin, end in *ans* or *ens*, as *amans*, *docens*; the paſſive in *us*, as *amatus*, *doctus*; tho' there are ſome of theſe that are active, namely thoſe of verbs deponents, as *locutus*. But there are others likewiſe which add to this paſſive ſignification a ſort of compulſive, or obligatory ſenſe; theſe are the participles in *dus*, as *amandus*, *which ought to be loved*; though ſometimes the latter ſignification is entirely loſt.

The property of the participles of verbs active, is to ſignify the action of the verb, as it is in the verb, that is, in the courſe of the action itſelf; whereas the verbal nouns, which ſignify actions alſo, ſignify them rather in the habit than in the act: for which reaſon the participles have the ſame government as the verb, as *amans deum*; whereas verbal nouns have only the

ſame government as nouns, as *amator dei*: and the participle itſelf has the ſame government as nouns when it ſignifies rather the habit than the act of the verb, by reaſon it then has only the nature of a ſimple noun verbal, as *amans virtutis*.

In our language, the participles and gerunds are not at all diſtinguiſhable.

PARTICLE, in phyſiology, the minute part of a body, an aſſemblage of which conſtitute all natural bodies. See the articles ATOM and MATTER.

It is the various arrangement and texture of theſe particles, with the difference of coheſion, *&c.* that conſtitute the various kinds of bodies. The ſmalleſt particles cohere with the ſtrongeſt attraction, and compoſe bigger particles of weaker coheſion, and many of theſe cohering compoſe bigger particles, whoſe vigour is ſtill weaker; and hereupon the operations in chemiſtry, and the colours of natural bodies depend, and which, by cohering, compoſe bodies of ſenſible bulk. The coheſion of the particles of matter, the epicureans imagined, was effected by means of hooked atoms; the ariſtotelians, by reſt; but Sir Iſaac Newton ſhews, that it is done by means of a certain power, whereby the particles mutually attract and tend towards each other. By this attraction of the particles, he ſhews, that moſt of the phænomena of the leſſer bodies are affected, as thoſe of the heavenly bodies are, by the attraction of gravity. See ATTRACTION and GRAVITATION.

PARTICLE, in grammar, a denomination for all thoſe ſmall words that tie or unite others together, or that expreſs the modes or manners of words, uſually included by grammarians under theſe four parts of ſpeech, *viz.* adverbs, prepoſitions, interjections, and conjunctions. See the articles PARTS *of ſpeech*, ADVERB, *&c.*

Mr. Locke obſerves, that it is in the right uſe of particles, the clearneſs and beauty of a good ſtyle more particularly conſiſts. To expreſs the dependence of his thoughts and reaſonings, one upon another, a man muſt have words to ſhew what connection, reſtriction, diſtinction, oppoſition, emphaſis, *&c.* he gives to each reſpective part of his diſcourſe. This cannot be rightly underſtood without a clear view of the poſtures, ſtands, turns, limitations, exceptions, and ſeveral other thoughts of the mind. Of theſe there is a great variety, much exceeding the number of particles that moſt languages have to expreſs them by; for which reaſon it happens, that moſt of theſe particles have divers, and ſometimes almoſt oppoſite ſignifications.

PARTICULAR, *particularis*, a relative term referring to ſpecies or individual, and oppoſed to general or univerſal. See the articles SPECIES and GENERAL.

There is this difference between particular and ſingular, that particular denotes a thing taken as a part, as Peter in reſpect of mankind; whereas ſingular denotes the part taken after the manner of a whole, as Peter conſidered in himſelf. See the article SINGULAR.

PARTIES, in law, ſignify the perſons that are named in a deed or fine, *viz.* thoſe that made the deed, or levied the fine, and alſo thoſe to whom the ſame was made or levied.

Here it is to be obſerved, that if an indenture was made between two parties, mentioned particularly in the beginning of the deed, and therein one of them grants to another that is not named at the beginning thereof, ſuch perſon is no party to that deed, nor can take any thing thereby. The parties to a ſuit at law are the plaintiff and defendant, who carry on the ſuit.

PARTING, or DEPARTING, a method of ſeparating gold and ſilver, by means of aqua fortis; for the operation of which ſee ASSAYING and QUARTATION.

PARTITION, in law, ſignifies a diviſion of lands, *&c.* deſcended by common law or cuſtom among coheirs or parceners, being two at leaſt. Partition may alſo be made by joint tenants, and tenants in common by aſſent, deed, or writ. See the article CO-PARCENERS.

PARTITION, in rhetoric, the ſame with diviſion. See the article DIVISION.

PARTITION, in muſic, the diſpoſition of the ſeveral parts of a ſong ſet on the ſame leaf, ſo as upon the uppermoſt ranges of lines are found the treble; in another, the baſs; in another, the tenor, *&c.* that they may be all ſung or played, either jointly or ſeparately. See the articles PART, MUSIC, *&c.*

PARTITION, in architecture, that which divides or ſeparates one room from another. See the article BUILDING.

PARTITION, in heraldry. See the article QUARTERING.

PARTITIONE FACIENDA, in law, a writ which lies for thoſe who hold lands or tenements pro indiviſo, and would ſever

ſever to every one his part, againſt them that refuſe to join in partition, as co-partners.

PARTNER and PARTNERSHIP. See the article FELLOWSHIP, &c.

If there be ſeveral joint partners, and a perſon has dealings generally with one of them in matters concerning their joint trade, whereby a debt becomes due to the ſaid perſon, it ſhall charge them jointly and the ſurvivors of them; but if the perſon only dealed with one of the partners upon a ſeparate account, in that caſe the debt ſhall only affect that partner and his executors. If one or more of the joint traders become bankrupt, his or their proportions are only aſſignable by the commiſſioners, to be held in common with the reſt who are not bankrupts. If one of two partners becomes a bankrupt, the commiſſioners cannot meddle with the intereſt of the other, for it is not affected with the bankruptcy of his companion. Payment to one of the partners, is payment to them all.

PARTNERS, in a ſhip, are ſtrong pieces of timber bolted to the beams incircling the maſts, to keep them ſteady in their ſteps, and alſo keep them from rolling, that is, falling over the ſhip's ſides. There are alſo of theſe partners at the ſecond deck, to the ſame end; only the mizen-maſt hath but one pair of partners, in which that maſt is wedged ſo firm that it cannot move. Some ſhips do not ſail well, unleſs their maſts are looſe, and have leave to play in the partners; but in a ſtorm this is dangerous, leſt the partners ſhould be wronged, (as they ſay) *i. e.* forced out of their places; for then there is no help but to cut the maſt by the board.

PARTRIDGE, in ornithology, is a ſpecies of tetrao, with a naked ſcarlet mark behind the eyes. See TETRAO.

The common partridge is too well known, to need a farther deſcription: it is common in fields, and called by authors perdix. But beſides the common kind, there is another ſomewhat larger ſpecies, called the red-legged partridge, with a grey tail, variegated in the upper part with brown.

Partridges are caught by means of nets, bird-lime, ſetting-dogs, &c. as alſo by driving. See NET, BIRD-LIME, &c.

PARTURITION, the ſame with delivery. See the article DELIVERY.

PARTY, in politics, denotes a faction conſidered as oppoſing another: ſuch are the whigs and tories. See the articles WHIG and TORIES.

In law, party-jury is one impanelled in actions brought for or againſt foreigners. See the article MEDIETAS LINGUÆ.

In a military ſenſe, party denotes a ſmall body of men, whether foot or horſe, or both, ſent on ſome expedition.

PARTY, or PARTI, in heraldry. See the article PARTI.

PARU, in ichthyology, a ſpecies of chætodon. See the article CHÆTODON.

PARULIDES, in ſurgery, tumours and inflammations of the gums, commonly called gum-boils.

They are to be treated with diſcutients, like other inflammatory tumours. Sage, camomile and elder-flowers, boiled in milk or water, make a gargariſm to be held in the mouth warm; and the remaining herbs may be ſowed up in a bag, and applied hot to the cheeks. See the article DISPERSION.

But if the diſorder cannot be thus diſperſed, emollient applications of mallows, &c. are good; and to forward the maturation externally, a half-roaſted fig may be applied: and when the ſoftneſs of the tumour ſhews that the matter is ſuppurated, it ought immediately to be opened by the lancet, to prevent the matter's lodging there, and eroding the bone, and producing a fiſtula or caries. After it is opened, the matter ſhould be gently preſſed out with the fingers, and the mouth frequently waſhed with red wine mixed with a decoction of vulnerary herbs till it is well. When the ulcer has penetrated deep, it will be neceſſary to inject the ſame liquors with a ſyringe, and compreſs the part by a proper external bandage, to make the bottom part heal firſt; and when it is already become fiſtulous, and has callous edges, it may then often be cured by injecting tincture of myrrh, and elixir proprietatis, continuing this for ſome time. If all theſe prove ineffectual, the fiſtula muſt be laid open by inciſion, and the caries removed by medicines, cauſtics, or the actual cautery. If this proceeds, as ſometimes it does, from a carious tooth, this is firſt of all to be extracted, otherwiſe the tumour will degenerate into a fiſtula: and it is always beſt to be early in making the inciſion.

PARUS, the TITMOUSE, in ornithology. See the article TITMOUSE.

PARYPATE, in the antient muſic. See the article DIAGRAM.

PAS, a town of the french Netherlands, twelve miles ſouth-weſt of Arras.

PASCHAL, ſomething belonging to the paſſover or eaſter. See the articles PASSOVER and EASTER.

PASCHAL LETTER. See LETTER.

PASLEY, a town of Scotland, in the county of Renfrew, ſix miles weſt of Glaſgow.

PASQUIN, a mutilated ſtatue at Rome, in a corner of the palace of the Urſini: it takes its name from a cobler of that city called Paſquin, famous for his ſneers and gibes, and who diverted himſelf with paſſing his jokes on all the people who went through that ſtreet. After his death, as they were digging up the pavement before his ſhop, they found in the earth the ſtatue of an antient gladiator, well cut, but maimed, and half ſpoiled: this they ſet up in the place where it was found, and by common conſent named it Paſquin. Since that time all ſatires are attributed to that figure, and are either put into its mouth or paſted upon it, as if they were wrote by Paſquin redivivus; and theſe are addreſſed by Paſquin to Marforio, another ſtatue at Rome. When Marforio is attacked, Paſquin comes to his aſſiſtance; and when Paſquin is attacked, Marforio aſſiſts him in his turn.

PASQUINADE, a ſatirical libel faſtened to the ſtatue of Paſquin: theſe are commonly ſhort, merry, and pointed; and from hence the term has been applied to all other lampoons of the ſame caſt. The difference between a paſquinade and a ſatire is, that the end of the latter is to correct and reform, while that of the former is only to ridicule and expoſe.

PASS, a ſtrait, difficult, and narrow paſſage, which ſhuts up the entrance into a country.

The firſt care of the general of an army is to ſeize the paſſes of the country into which he would carry the war, to fortify them, and take care that they are well guarded.

PASS *of arms*, in chivalry, a bridge, road, *&c.* which the antient knights undertook to defend.

The knights who held a paſs, hung up their arms on trees, paſes, columns, *&c.* erected for that purpoſe; and ſuch as were diſpoſed to diſpute the paſs, touched one of the pieces of armour with his ſword, which was a challenge the other was obliged to accept; when the vanquiſhed gave the victor ſuch a prize as was before agreed on.

PASS, or PASSADE, in fencing, an advance or leap forward upon the enemy. Of theſe there are ſeveral kinds, as paſſes within, above, beneath, to the right, the left, and paſſes under the line, *&c.* The meaſure of the paſs is, when the two ſmalls of the ſwords are ſo near, as that they may touch one another.

PASSADE, in the manege, is a turn or courſe of a horſe backwards or forwards, on the ſame ſpot of ground. Hence there are ſeveral ſorts of paſſades, according to the different ways of turning, in order to part, or return upon the ſame tread, which is called cloſing the paſſade; as the paſſade of one time, the paſſade of five times, and the raiſed or high paſſades, in which the demi-volts are made into curvets. See the articles CURVET and VOLT.

In all paſſades the horſe, in making the demi-volt, ſhould gather and bring in his body, making his haunches accompany his ſhoulders, without falling back, or not going forward enough each time; and he ſhould go in a ſtrait line, without traverſing or turning his croup out of the line.

PASSAGE, in the manege, is a horſe's walking or trotting in ſuch a manner that he raiſes the outward hind-leg, and the inward fore-leg together; and ſetting theſe two on the ground, raiſes the other two alternately, never gaining above a foot of ground at a time. A horſe is paſſaged upon two ſtrait lines along a wall or hedge, and alſo in going ſideways in a circle round a center. The beauty of the paſſage conſiſts in holding the legs long in the air.

PASSAGE, or PASSO, in muſic, a part of an air or tune, conſiſting of ſeveral ſhort notes, as quavers, ſemi-quavers, *&c.* laſting one, two, or at moſt three meaſures, in the beginning of a piece, which is to be afterwards imitated in the other notes of the piece, not with the ſame chords or notes, but only by obſerving the ſame motion, number and figure, as in the notes of the firſt paſſage. This is called by the Italians contrapunto d'un ſol paſſo.

Birds of PASSAGE, a name given to thoſe birds which at certain ſtated ſeaſons of the year remove from certain countries, and at other ſtated times return to them again, as our quails, woodcocks, ſtorks, nightin-

nightingales, ſwallows, and many other ſpecies. The generality of birds that remain with us all winter have ſtrong bills, and are enabled to feed on what they can find at that ſeaſon; thoſe which leave us, have uſually very ſlender bills, and their food is the inſects of the fly-kind; which diſappearing towards the approach of winter, compel them to ſeek them in the warmer regions where they are to be found. Among the birds of paſſage, the fieldfare, the redwing, the woodcock, and the ſnipe, come to us in the autumn, at the time when the ſummer birds are leaving us, and go from us again in ſpring, at the time when theſe return; and of theſe the two laſt often continue with us through the ſummer, and breed; ſo that the two firſt ſeem the only kinds that certainly leave us at the approach of ſpring, retiring to the northern parts of the continent, where they live during the ſummer, and breed; and at the return of winter, are driven ſoutherly from thoſe frigid climes, in ſearch of food, which there the ice and ſnow muſt deprive them of.

Right of PASSAGE, in commerce, is an impoſition or duty exacted by ſome princes, either by land or ſea, in certain cloſe and narrow places in their territories, on all veſſels and carriages, and even ſometimes on perſons or paſſengers coming in or going out of ports, *&c.* The moſt celebrated paſſage of this kind in Europe is the Sound, the dues for paſſing which ſtrait belong to the king of Denmark, and are paid at Elſenore or Cronenburg.

PASSAGE, in geography, a port-town of Spain, in the province of Biſcay, ſixty miles eaſt of Bilboa.

PASSANT, in heraldry, a term applied to a lion, or other animal, in a ſhield, appearing to walk leiſurely: for moſt beaſts, except lions, the term trippant is frequently uſed inſtead of paſſant.

PASSAO, or CAPE PASSAO, a promontory of Peru, juſt under the equator: weſt long. 81°.

PASSAU, the capital of the biſhopric of the ſame name, in the circle of Bavaria, ſituated on the confluence of the rivers Danube, Inn, and Ilts: eaſt long. 13° 30′ north lat. 48° 30′.

PASSER, the SPARROW. See SPARROW.

PASSERES is alſo the name of a claſs of birds, with a conic and much attenuated beak. See ORNITHOLOGY.

PASSER FLUVIATILIS, a name uſed by ſome for the common flounder.

PASSERINA, in botany, a genus of the octandria-monogynia claſs of plants, the flower of which is compoſed of a ſingle petal, divided into four oval ſegments at the limb: the fruit is a coreaceous capſule, of an oval ſhape, with only one cell, and containing a ſingle oval ſeed, pointed at each end.

PASSIFLORA, PASSION-FLOWER, in botany, a genus of the gynandria-pentagynia claſs of plants, the corolla of which conſiſts of five petals, of the largeneſs and figure of thoſe of the cup: the fruit is a berry, ſupported on a pedicle. This is an extremely beautiful flower, a ſpecies of which, called murucuja, or the lunated-leaved, ſcarlet, paſſion-flower, is repreſented in plate CXCIV. fig. 8.

PASSIONS, in moral philoſophy, are certain motions of the ſoul, which make it purſue what appears to be good, and avoid whatever threatens evil. See the articles GOOD and EVIL.

By reflecting, ſays Mr. Locke, on the various modifications or tempers of the mind, and the internal ſenſations which pleaſure and pain, good and evil produce in us, we may thence form to ourſelves the ideas of our paſſions. Thus, by reflecting upon the thought we have of the delight which any thing is apt to produce in us, we form an idea which we call love. Deſire is that uneaſineſs which a man finds in himſelf upon the abſence of any thing, the preſent enjoyment of which cauſes delight. Joy is a delight of the mind, ariſing from the preſent, or aſſured approaching, poſſeſſion of ſome good. Sorrow is an uneaſineſs of the mind, upon the thought of a good loſt, or the ſenſe of a preſent evil. Hope is a pleaſure in the mind, upon the thought of a probable future enjoyment of a thing which is apt to delight. Fear is an uneaſineſs of the mind, upon the thought of a future evil likely to befal us. Anger is a diſcompoſure of the mind, upon the receit of injury, with a preſent purpoſe of revenge. Deſpair is the thought of the unattainableneſs of any good. Envy is an uneaſineſs of mind, cauſed by the conſideration of a good we deſire, obtained by one we think ſhould not have had it before us.

On the juſt regulation and ſubordination of the paſſions, depends, in a great meaſure, the happineſs of mankind. See the articles ETHICS and HAPPINESS.

It ought to be obſerved here, in reference to the paſſions, that the removal or leſſening

ſening of a pain is conſidered, and operates as pleaſure; and the diminiſhing of a pleaſure as pain; and, farther, that the paſſions in moſt perſons operate on the body, and cauſe various changes in it; whence the conſideration of them in medicine and painting.

PASSIONS, in medicine, make one of the non-naturals, and produce very ſenſible effects. Joy, anger, and fear are the principal. In the two firſt, the ſpirits are hurried with too great vivacity; whereas, in fear or dread, they are as it were curbed and concentrated: whence we may conclude, that they have a very bad effect upon health; and therefore it will be beſt to keep them within bounds as much as poſſible, and to preſerve an inward ſerenity, calmneſs, and tranquility. Continual ſorrow and anguiſh of mind render the fluids thick, and generate viſcid and acid crudities in the ſtomach, and at length render the body unapt for a due circulation; whence proceed obſtructions of the viſcera, and many chronical diſorders. Anger conſtringes the bilious veſſels in particular, and cauſes too great an evacuation of the bile; produces ſtrictures in the ſtomach and duodenum; whence the bilious humours are amaſſed and corrupted; laying a foundation for vomiting, bilious fevers, and cardialgiæ.

The paſſions of the mind, in general, chiefly affect the ſtomach, invert its motion, hinder digeſtion and chylification; whence many crudities ariſe, fruitful of various diſeaſes: hence it is very dangerous, after violent commotions of the mind, to ſit down to a meal; or, during that time, to be greatly affected with any accident that may happen.

For the treatment of the iliac, hypochondriac, coeliac, hyſteric, &c. paſſion, ſee the articles ILIAC, &c.

PASSIONS, in painting, are the external expreſſions of the different diſpoſitions and affections of the mind; but particularly their different effects upon the ſeveral features of the face: for though the arms, and indeed every part of the body, ſerve likewiſe, by their quick, languid, and variouſly diverſified motions, to expreſs the paſſions of the ſoul; yet, in painting, this difference is moſt conſpicuous in the face.

In ſorrow, joy, love, ſhame, and compaſſion, the eyes ſwell all of a ſudden, are covered with a ſuperabundant moiſture, and drop tears; and in grief eſpecially, the corners of the mouth hang down, the eye-lids are half ſhut, and the pupil of the eye is elevated and half covered; and all the other muſcles of the face are relaxed, ſo that the viſage appears longer than ordinary.

In fear, terror, fright, and horror, the eye-brows are greatly elevated, the eye-lids are expanded as wide as poſſible, ſo as to diſcover the white of the eye, and the pupil is depreſſed and half covered by the lower eye-lid; the hair ſtands an end; the mouth is at the ſame time wide open, and the lips ſo far drawn back, that the teeth both of the upper and under jaw appear.

Contempt is expreſſed by raiſing one ſide of the upper-lip, ſo as to diſcover the teeth, whilſt the other ſide has a movement like that in laughter; the eye, on that ſide where the teeth appear, is half ſhut, whilſt the other remains open; however, both the pupils are depreſſed.

In jealouſy, envy, hatred, and malice, the eye-brows are knit; and, in laughter, all the parts agree, tending as it were towards the center of the face.

Mr. le Brun has been extremely happy in expreſſing the ſeveral paſſions, and the examples he has left of them deſerve imitation.

PASSIONS, in poetry, are of ſingular uſe in diſtinguiſhing the characters of the actors. See the article CHARACTER.

But though the paſſions be always neceſſary, yet all are not equally ſuitable to every kind of poetry: thus comedy has joy and agreeable ſurpriſe for its part; tragedy, on the contrary, has terror and compaſſion; and epic, as a medium between the two, takes in both theſe kinds of paſſions, though its proper paſſion is admiration. See the articles COMEDY, TRAGEDY, and EPIC.

PASSION, *or croſs of the* PASSION, in heraldry, is ſo called, becauſe reſembling the ſhape of that on which our Saviour is thought to have ſuffered; that is, not croſſed in the middle, but a little below the top, with arms ſhort in proportion to the length of the ſhaft. See plate CXCIV. fig. 5.

PASSION FLOWER, *paſſiflora*, in botany. See the article PASSIFLORA.

PASSION-WEEK, the week immediately preceding the feſtival of Eaſter: ſo called, becauſe in that week our Saviour's paſſion and death happened. See EASTER.

The Thurſday of this week is called Maunday-Thurſday; the Friday, Good-Friday;

Friday; and the Saturday, the great Sabbath.

PASSIVE, in general, denotes ſomething that ſuffers the action of another, called an agent, or active power. See the articles AGENT and ACTIVE.

In grammar, the verb or word that expreſſes this paſſion, is termed a paſſive verb; which, in the learned languages, has a peculiar termination, as *amor*, *doceor*, &c. in Latin; that is, an *r* is added to the actives *amo*, *doceo*: and, in the Greek, the inflection is made by changing ω into ομαι, as τυπτω, τυπτομαι, &c. But, in the modern languages, the paſſive inflection is performed by means of auxiliary verbs, joined to the participle paſſive; as *I am praiſed*, in latin *laudor*, and in greek επαινεομαι; or *I am loved*, in latin *amor*, and in greek φιλεομαι. Thus it appears, that the auxiliary verb *I am*, ſerves to form the paſſives of engliſh verbs; and the ſame holds of the french, as *je ſuis loué*, I am praiſed; *j' aye eté loué*, I have been praiſed, &c.

PASSOVER, a ſolemn feſtival of the Jews, celebrated on the fourteenth day of the month next after the vernal equinox, and inſtituted in commemoration of their coming out of Egypt; becauſe on the night before their departure the deſtroying angel, who put to death the firſt-born of the Egyptians, paſſed over the houſes of the Hebrews, which were ſprinkled with the blood of a lamb. The whole tranſaction is related in the twelfth chapter of Exodus.

They were ordered before this feſtival to kill the paſchal lamb, and to ſprinkle their door-poſts with its blood; and the following night, which was the grand feaſt of the paſſover, and which was to continue ſeven days, they were to eat the lamb roaſted with a ſallad of wild-lettuces, or other bitter herbs, in the poſture of travellers; and if any part remained the day following, it was to be thrown into the fire; and for eight days together no leavened bread was to be uſed, on pain of being cut off from the people. The rabbins inform us of ſome other obſervances of the Jews in relation to the paſſover. They were ſo ſcrupulous in abſtaining from leavened bread during this feſtival, that they uſually examined every hole and corner of the houſe, that not the leaſt crumb of it might be concealed. On the vigil of the feaſt the matron of the family ſpread a table, and ſet on it two unleavened cakes, two pieces of the lamb, one boiled and the other roaſted, to put them in mind that God had delivered them with an out-ſtretched arm: to this they added ſome ſmall fiſhes, becauſe of the leviathan; a hard egg, becauſe of the bird ziz; ſome meal, becauſe of the behemoth: theſe three animals being, according to their rabbinical doctors, appointed for the feaſt of the elect in the other life. The father of the family ſat down with his children and ſlaves, took bitter herbs, eat them with muſtard, and diſtributed them. Then they eat of the lamb, the inſtitution of which was at that time recited by the maſter of the family, and the whole repaſt was attended with hymns and prayers. The modern Jews in general obſerve the ſame ceremonies.

PASS PAROLE, a command given at the head of an army, and thence communicated to the rear by paſſing it from mouth to mouth.

PASS-PAR-TOUT, a maſter-key; or a key that opens ſeveral locks belonging to the ſame houſe or apartment.

PASS-PORT, or PASS, a licence or writing obtained from a prince or governor, granting liberty and ſafe conduct to paſs through his territories without moleſtation.

Paſs-port alſo ſignifies a licence obtained for importing contraband goods, or for exporting and importing merchandize without paying the duties; theſe laſt licences are always given to embaſſadors and other public miniſters, for their baggage, equipage, &c.

If any perſon forge or counterfeit a paſſport, commonly called a Mediterranean paſs, for any ſhip, or ſhall alter or eraze any paſs made out by the commiſſioners for executing the office of lord high admiral, or ſhall publiſh as true any forged, altered, or erazed paſs, knowing the ſame to be forged, &c. every ſuch perſon being convicted in any part of his majeſty's dominions where ſuch offence may be committed, ſhall be guilty of felony without benefit of clergy, by 4 Geo. II. cap. 18. ſect. 1.

PASS-VOLANT, or PASSE-VOLANT, in a military ſenſe, the ſame with a faggot. See the article FAGGOT.

In France all paſs-volants are marked on the cheek with a fleur de lis.

PASTBOARD, a kind of thick paper formed of ſeveral ſheets of paper paſted together.

The chief uſe of paſtboard is in binding

books, making letter-cases, &c. Paste-boards, on importation, pay the thousand, 2s. 6 $\frac{80}{100}$ d. and on exportation draw back 2s. 3d. and besides for every hundred weight 7s. 6d. which is drawn back on exportation.

PASTE, a composition of water and flour, boiled to a consistence; used by various artificers, as sadlers, upholsterers, book-binders, &c.

In cookery, paste is the composition of flour, &c. wherein pies are baked: and in confectionary, paste denotes a preparation of some fruit, made by beating the pulp thereof with some fluid, or other admixture; and afterwards drying it with sugar, till as pliable as common paste.

PASTE, in the glass-trade, a kind of coloured glass, made of calcined crystal, lead, and metallic preparations, so as to imitate the natural gems; for the manner of effecting which, see GEM.

PASTEL, a name by which some call isatis, or woad. See the article ISATIS.

PASTERN *of a horse*, in the manege, is the distance between the joint next the foot, and the coronet of the hoof. This part should be short, especially in middle-sized horses, because long pasterns are weak, and cannot so well endure travelling.

PASTERN-JOINT, the joint next a horse's foot.

When the pastern-joint swells after travelling, chase it every morning and evening with a mixture of two parts of brandy, and one of oil of nuts.

PASTIL, or PASTEL, among painters, a kind of paste made of different colours, ground up with gum-water, in order to make crayons. See CRAYON.

Sometimes the crayons themselves are called pastils.

PASTIL, in pharmacy, is a dry composition of sweet-smelling resins, aromatic woods, &c. sometimes burnt to clear and scent the air of a chamber.

There are also pastils for the mouth, which being chewed, procure a sweet breath.

PASTINACA, the PARSNEP, in botany. See the article PARSNEP.

PASTINACA MARINA, the FIRE FLAIRE, in ichthyology, the name by which authors call the smooth ray-fish, with a long spine in the tail, serrated before. See the article RAY-FISH.

PASTO, a city of Popayan, in south America; west long. 77°, north lat. 2°.

PASTOR, properly signifies a shepherd, but is now generally used for a parson or minister that hath cure of souls. See the articles PARSON and CURE.

PASTORAL, in general, something that relates to shepherds; hence we say, pastoral life, manners, poetry, &c.

The original of poetry is ascribed to that age which succeeded the creation of the world: and as the keeping of flocks seems to have been the first employment of mankind, the most antient sort of poetry was, probably, pastoral. It is natural to imagine, that the leisure of those antient shepherds admitting and inviting some diversion, none was so proper to that solitary and sedentary life as singing; and that in their songs they took occasion to celebrate their own felicity. From hence a poem was invented, and afterwards improved to a perfect image of that happy time; which, by giving us an esteem for the virtues of a former age, might recommend them to the present. And since the life of shepherds was attended with more tranquility than any other rural employment, the poets chose to introduce their persons from whom it received the name of pastoral.

A pastoral is an imitation of the action of a shepherd, or one considered under that character. The form of this imitation is dramatic, or narrative, or mixed with both; the fable simple; the manners not too polite nor too rustic; the thoughts are plain, yet admit a little quickness and passion, but that short and flowing; the expression humble, yet as pure as the language will afford; neat, but not florid; easy, and yet lively. In short, the fable, manners, thoughts, and expressions are full of the greatest simplicity in nature.

The complete character of this poem consists in simplicity, brevity, and delicacy; the two first of which render an eclogue natural, and the last delightful.

If we would copy nature, it may be useful to take this idea along with us, that pastoral is an image of what they call the golden age. So that we are not to describe our shepherds, as shepherds at this day really are, but as they may be conceived then to have been, when the best of men followed the employment. To carry this resemblance yet farther, it would not be amiss to give these shepherds some skill in astronomy, as far as it may be useful to that sort of life. And an air of piety to the gods should shine through the poem, which so visibly appears in all the

the works of antiquity: and it ought to preſerve ſome reliſh of the old way of writing; the connection ſhould be looſe, the narrations and deſcriptions ſhort, and the periods conciſe. Yet it is not ſufficient that the ſentences only be brief, the whole eclogue ſhould be ſo too. For we cannot ſuppoſe poetry, in thoſe days, to have been the buſineſs of men, but their recreation at vacant hours.

But with reſpect to the preſent age, nothing more conduces to make theſe compoſures natural, than when ſome knowledge in rural affairs is diſcovered. This may be made to appear rather done by chance than on deſign, and ſometimes is beſt ſhewn by inference; leſt, by too much ſtudy to ſeem natural, we deſtroy that eaſy ſimplicity from whence ariſes the delight. For what is inviting, in this ſort of poetry, proceeds not ſo much from the idea of that buſineſs, as of the tranquillity of a country life.

We muſt, therefore, uſe ſome illuſion to render a paſtoral delightful; and this conſiſts in expoſing the beſt ſide only of a ſhepherd's life, and in concealing its miſeries. Nor is it enough to introduce ſhepherds diſcourſing together in a natural way, but a regard muſt be had to the ſubject, that it contain ſome particular beauty in itſelf, and that it be different in every eclogue. Beſides, in each of them, a deſigned ſcene or proſpect is to be preſented to our view, which ſhould likewiſe have its variety. This variety is obtained, in a great degree, by frequent compariſons, drawn from the moſt agreeable objects of the country; by interrogations to things inanimate; by beautiful digreſſions, but thoſe ſhort; ſometimes by inſiſting a little on circumſtances; and laſtly, by elegant turns on the words, which renders the numbers extremely ſweet and pleaſing. As for the numbers themſelves, though they are properly of the heroic meaſure, they ſhould be the ſmoothеſt, the moſt eaſy, and flowing imaginable.

It is by rules, like theſe, we ought to judge a paſtoral. And ſince the inſtructions given for any art are to be delivered as that art is in perfection, they muſt, in neceſſity, be derived from thoſe in whom it is acknowledged ſo to be. It is, therefore, from the practice of Theocritus and Virgil (the only undiſputed authors of paſtoral) that the critics have drawn the foregoing notions concerning it.

Theocritus excells all others in nature and ſimplicity. The ſubjects of his Idyllia are purely paſtoral; but he is not ſo exact in his perſons, having introduced reapers and fiſhermen, as well as ſhepherds. He is apt to be too long in his deſcriptions, of which that of the cup, in the firſt paſtoral, is a remarkable inſtance. In the manners he ſeems a little defective, for his ſwains are ſometimes abuſive and immodeſt, and, perhaps, too much inclining to ruſticity; for inſtance, in his fourth and fifth idyllia. But it is enough that all others learned their excellencies from him, and that his dialect alone has a ſecret charm in it, which no other could ever attain.

Virgil, who copies Theocritus, refines upon his original; and in all points where judgment is principally concerned, he is much ſuperior to his maſter. Tho' ſome of his ſubjects are not paſtoral in themſelves, but only ſeem to be ſuch, they have a wonderful variety in them, which the Greek was a ſtranger to. He exceeds him in regularity and brevity, and falls ſhort of him in nothing but ſimplicity and propriety of ſtyle; the firſt of which, perhaps, was the fault of his age, and the laſt of his language.

Among the moderns, their ſucceſs has been greateſt, who have moſt endeavoured to make theſe antients their pattern. The moſt conſiderable genius appears in the famous Taſſo and our Spenſer. Taſſo, in his Aminto, has as far excelled all the paſtoral writers, as in his Gieruſalemme he has out-done the epic poets of his country. But as this piece ſeems to have been the original of a new ſort of poem, the paſtoral comedy in Italy, it cannot ſo well be conſidered as a copy of the antients. Spenſer's Calendar, in Mr. Dryden's opinion, is the moſt complete work of this kind, which any nation has produced ever ſince the time of Virgil. Not but that he may be thought imperfect in ſome few points. His eclogues are ſomewhat too long, if we compare them with the antients. He is, ſometimes, too allegorical, and treats on matters of religion, in a paſtoral ſtyle, as the Mantuan had done before him. He has employed the lyric meaſure, which is contrary to the practice of the old poets. His ſtanza is not ſtill the ſame, nor always well choſen; this laſt may be the reaſon why his expreſſion is ſometimes not conciſe enough: for the tetraſtic has obliged him to extend his ſenſe to the

length of four lines, which would have been more closely confined in the couplet. In the manners, thoughts, and characters, he comes near to Theocritus himself; though, notwithstanding all the care he has taken, he is certainly inferior in his dialect: for the doric had its beauty and propriety in the time of Theocritus; it was used in part of Greece, and frequent in the mouths of many of the greatest persons; whereas the old english and country phrases of Spenser were either entirely obsolete, or spoken only by people of the lowest condition. As there is a difference between simplicity and rusticity, so the expression of simple thoughts should be plain, but not clownish. The addition he has made of a calendar to his eclogues is very beautiful; since by this, besides the general moral of innocence and simplicity, which is common to other authors of pastoral, he has one peculiar to himself; he compares human life to the several seasons, and at once exposes to his readers a view of the great and little worlds, in their various changes and aspects. Yet the scrupulous division of the pastorals into months has obliged him either to repeat the same description in other words, for three months together; or, when it was exhausted before, entirely to omit it: whence it comes to pass, that some of his eclogues (as the 6th, 8th, and 10th, for example) have nothing but their titles to distinguish them. The reason is evident, because the year has not that variety in it to furnish every month with a particular description, as it may every season.

PASTORAL STAFF, the same with crosier. See the article CROSIER.

PASTRY, that branch of cookery, which is chiefly taken up in making pies, pasties, cakes, &c.

PASTURE, or PASTURE-LAND, that reserved for feeding cattle.

Pasture-land is of such advantage to husbandry, that many prefer it even to corn-land, because of the small hazard and labour that attends it, and as it lays the foundation for most of the profit that is expected from the arable land, because of the manure the cattle afford which are fed upon it. Where dung is not to be bought, as is often the case in places distant from large towns, the farmer is forced to proportion his arable to his pasture-land, in such manner, that the cattle fed on the latter may be sufficient for a supply of dung, so necessary for producing the fruits of the former.

Pasture-lands are of three kinds: 1. The uplands: these lie so high as not to be overflowed by rivers, or land-floods. 2. Those low lands which lie near rivers and fens. And 3. Those that lie near the sea.

Pasture-land requires the refreshment of dung, as well as the arable or corn-land; but there is to be a difference made in the laying it on and spreading it. A harrow performs the office of spreading the dung on ploughed lands; but the best contrivance for pastures, is, to lay the dung in small heaps, and draw over it a gate stuck full of bushes. All dung that is laid on pasture-land, must be laid on in winter, that the rains may wash its fatness into the ground before the sun scorches it, or evaporates its goodness. Fine mould mixed with the dung, and spread with it over the land, is very good for pastures; for it is washed down to the very roots of the grass, and gives them a new and fine soil just in those places where it is most wanted.

The best manure for pasture-land is the rotten bottoms of old hay-stacks; for these moulder away into a very rich soil, and are always full of vast quantities of seed, fallen at times from the hay, which all grow when spread on the ground: and thus new nourishment, and a new set of plants are given at once to the exhausted ground. But as particularly useful as this is for pasture-ground, it is as improper for corn-land, and should by no means ever be suffered to mix with the manure for those grounds; as it will then raise grass and other plants, which tho' of use in the pasture are weeds among the corn.

Admeasurement of PASTURE. See the article ADMEASUREMENT.

PASTURE OF PLANTS, a term used by Tull, for the nourishment they draw from the earth. See the articles PLANT and VEGETATION.

PASTY, in cookery, a preparation of venison, veal, lamb, or other meat; which being well boned, beaten to a pulp, and highly seasoned, is inclosed in a proper paste, and baked in an oven.

PATAGONIA, the most southern part of south America, extending from the mouth of Rio di la Plata, in 36° of south lat. to Cape Horn, in 55° 30'.

PATAGONULA, or PATAGONICA, in botany, a genus of the pentandria-monogynia

gynia claſs of plants, with a monopetalous flower, that has ſcarce any tube, and is divided into five oval and acute ſegments: the fruit is an oval acuminated capſule, placed on a very large cup, with oblong emarginated ſegments; which ſtructure of the cup conſtitutes the eſſential diſtinction of the genus.

PATAI, a town of France, in the province of Orleanois, fourteen miles north of Orleans.

PATAN, the capital of a province in the Eaſt Indies, ſituated two hundred miles north of Huegly in Bengal: eaſt long. 89°, north lat. 27° 30′.

PATAVINITY, *patavinitas*, among critics, denotes a peculiarity of Livy's diction, derived from Patavium, or Padua, the place of his nativity; but wherein this patavinity conſiſts, they are by no means agreed.

PATCHUCA, or PATIOQUE, a city of Mexico: weſt long. 103°, north lat. 21°, ſubject to Spain.

PATE, in fortification, a kind of platform, reſembling what is called an horſeſhoe; not always regular, but generally oval, encompaſſed only with a parapet, and having nothing to flank it. It is uſually raiſed in marſhy grounds, to cover the gate of a place.

PATE'E, or PATTE'E, in heraldry, a croſs ſmall in the center, and widening to the extremes, which are very broad. See plate CXCIV. fig. 6. which is a croſs pattee, argent, upon a field ſable.

PATELLA, in anatomy, a bone which covers the fore-part of the joint of the knee, called alſo rotula, and popularly the knee-pan. The patella is convex on the outſide, and on the inſide unequal, having an eminence and two depreſſions. Its ſubſtance is ſpungeous, and conſequently it is brittle: it is connected by tendons and ligaments to the tibia and the os femoris, which is the ligament by which it is connected to the thigh, and has a motion of aſcent and deſcent in the flexion of the tibia. In infants and children it is cartilaginous.

Fracture of the PATELLA. The patella, or knee-pan, is much more ſubject to a tranſverſe fracture than to one in any other direction. The longitudinal fracture of this bone happens more rarely, but when it does, is much more eaſily cured; becauſe the fragments of the bone, in this caſe, generally keep in their right places, but when the bone is broken not only tranſverſely, but into ſeveral pieces, the caſe is yet more difficult and dangerous. The cure of this fracture, according to Heiſter, muſt be attempted in this manner: in a longitudinal or perpendicular fracture, the patient muſt be laid upon his back, and, extending the foot, the ſurgeon muſt replace the fragments on both ſides with the preſſure of his hands, binding them up carefully with the uniting bandage; which muſt be applied in this caſe in the ſame manner with that uſed in large wounds in the belly or forehead. But when the patella is broken tranſverſely, or into ſeveral pieces, the patient being laid in the ſame poſture, and extending his foot as before, the ſurgeon is with great care to endeavour with the palms of both his hands, aſſiſted by his fingers and thumbs, to bring together and replace the fragments in their natural ſituation; and when that is done, they muſt be retained firmly together, by means of a plaſter made in form of a half moon, or properly perforated, and then the foot and leg are to be bound up, and placed ſo that they cannot be eaſily moved: but to prevent the bone from being diſplaced again, the patient muſt not uſe his leg till after the ninth or tenth week. See the article FRACTURE.

PATELLA *luxated*. The patella is moſt uſually luxated either on the internal or external ſide of the joint, though phyſicians give accounts of its being ſometimes luxated both above and below it. Whenever the knee itſelf is perfectly luxated, the patella can ſcarce avoid being diſplaced at the ſame time, becauſe of its ſtrong connection to the thigh and to the tibia. See the article KNEE.

The reduction of a luxated patella is uſually no great difficulty. The patient is to be laid flat on his back upon a table or bed, or upon an even floor, ſo that his leg may be pulled out ſtraight by an aſſiſtant; when this is ſufficiently extended, the ſurgeon muſt graſp the patella with his fingers, and afterwards, by the aſſiſtance of his hand, preſs it ſtrongly into its proper place. This may be alſo poſſibly effected while the patient ſtands upright: when this is done, there remains nothing but carefully to bind up the part, and let the patient reſt for ſome days; ſometimes gently binding and extending his leg in the mean while, that it may not become ſtiff.

PATELLA, the LIMPET, is a genus of ſhell-fiſh, with a ſimple ſhell, of a conic or other gibboſe figure, and a very wide opening

opening at the mouth or bottom; always applying itſelf firmly to ſome ſolid body, which ſerves it in the place of another ſhell: the animal inhabiting it is called limax.

The ſummit of the limpet-ſhell is in ſome ſpecies acute, in others obtuſe, and in ſome depreſſed, perforated, ſtriated, faſciated, &c.

PATENT, in general, denotes ſomething that ſtands open or expanded: thus a leaf is ſaid to be patent when it ſtands almoſt at right angles with the ſtalk.

PATENT, or LETTERS-PATENT. See the article LETTER.

PATENT-GLOBES. See the article GLOBE.

PATENTEE, a perſon to whom the king has granted his letters-patent.

PATER PATRATUS, in roman antiquity, the principal perſon among the feciales or college of heralds. See the article FECIALES.

PATER-NOSTER, the Lord's-prayer, ſo called from the two firſt words thereof in latin. It is alſo ſometimes uſed for a chaplet or ſtring of beads. And, in architecture, the ſame term is uſed for a ſort of ornament cut in the form of beads, either oval or round, uſed on aſtragals, baguettes, &c.

PATER-NOSTRE'E, in heraldry, or a CROSS-PATERNOSTRE'E, is a croſs made of beads.

PATERA, in roman antiquity, a goblet or veſſel uſed by the Romans in their ſacrifices; in which they offered their conſecrated meats to the gods, and with which they made libations. The patera was of gold, ſilver, marble, braſs, glaſs, or earth; and they uſed to incloſe it in urns, with the aſhes of the deceaſed, after it had ſerved for the libations of wine and other liquors at the funeral.

The patera is an ornament in architecture, frequently ſeen in the doric frieze, and in the tympans of arches.

PATERNITY, the quality of a father.

PATH, in general, denotes the courſe or tract marked out or run over, by a body in motion. See MOTION.

Concerning the path of a ſatellite, or ſecondary planet, on an immoveable plane, Mr. Maclaurin has demonſtrated the following propoſitions.

Prop. I. The path of the ſatellite, on an immoveable plane, is the epicycloid that is deſcribed by a given point in the plane of a circle, which revolves on a circular baſe; having its center in the center of the ſun, and its diameter in the ſame proportion to the diameter of the revolving circle, as the periodic time of the primary about the ſun, to the time of the ſynodic revolution of the ſatellite about the primary: the tangent of the path is perpendicular to the right line that joins the ſatellite to the contact of the two circles; and the abſolute velocity of the ſatellite is always as its diſtance from that contact.

Let T denote the periodic time of the primary about the ſun, *t* the periodic time of the ſatellite about the primary. Let S (plate CXCV. fig. 1.) repreſent the ſun, A*a* the orbit of the primary: upon the radius AS, take AE to AS as *t* is to T. From the center S, deſcribe the circle E*e*Z; and from the center A, the circle EMF. Let this circle EMF revolve on the other E*e*Z, as its baſe: then a point L, taken on the plane of the circle EMF, at the diſtance AL, equal to the diſtance of the ſatellite from the primary, ſhall deſcribe the path of the ſatellite.

For ſuppoſe the circle EMF to move into the ſituation *emf*, the point A to *a*, L to *l*; and let AL and *al*, produced, meet EMF and *emf*, in M and *m*. Upon the arc *em* take *er*=EM; then ∠*ear*=∠EAM. Let *ar* meet the circle *eld*, deſcribed from the center *a*, with the diſtance *al*, in *q*; and becauſe ∠*eaq*=∠EAL, the angle *eaq* repreſents the elongation of the ſatellite from the ſun at its firſt place L. Again, becauſe *em*(=*er*+*rm*)=*e*E+EM, and *er*=EM, it follows, that *rm*=*e*E; and, conſequently, ∠*ram*:∠*e*SE :: SE : AE :: T−*t* : *t*; or, as the angular velocity of the ſatellite from the ſun, to the angular velocity of the primary about the ſun. But ES*e* is the angle deſcribed by the primary about the ſun; conſequently *ram*, or *qal*, is the ſimultaneous increment of the elongation of the ſatellite from the ſun; *l* is its place when the primary comes to *a*; and the epicycloid, deſcribed by *l*, is the path of the ſatellite.

Becauſe the circle EMF moves on the point E, the direction of the motion of any point L, is perpendicular to EL; or the tangent of the path, at any point L, is perpendicular to EL. The velocity of any point L, is as its diſtance EL; and the motion of the primary A being ſuppoſed uniform, and repreſented by EA, the velocity of the ſatellite ſhall be repreſented by EL.

Prop. II. Upon AS (*ibid.*) take AB : AS :: *t* : T (or AB : AE :: AE : AS); upon

Fig. 1. The PATH of a Satellite.

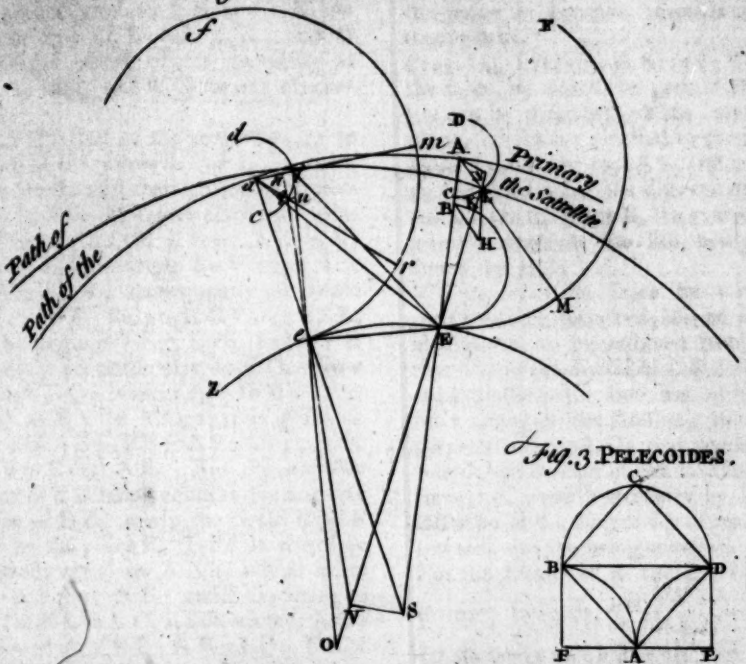
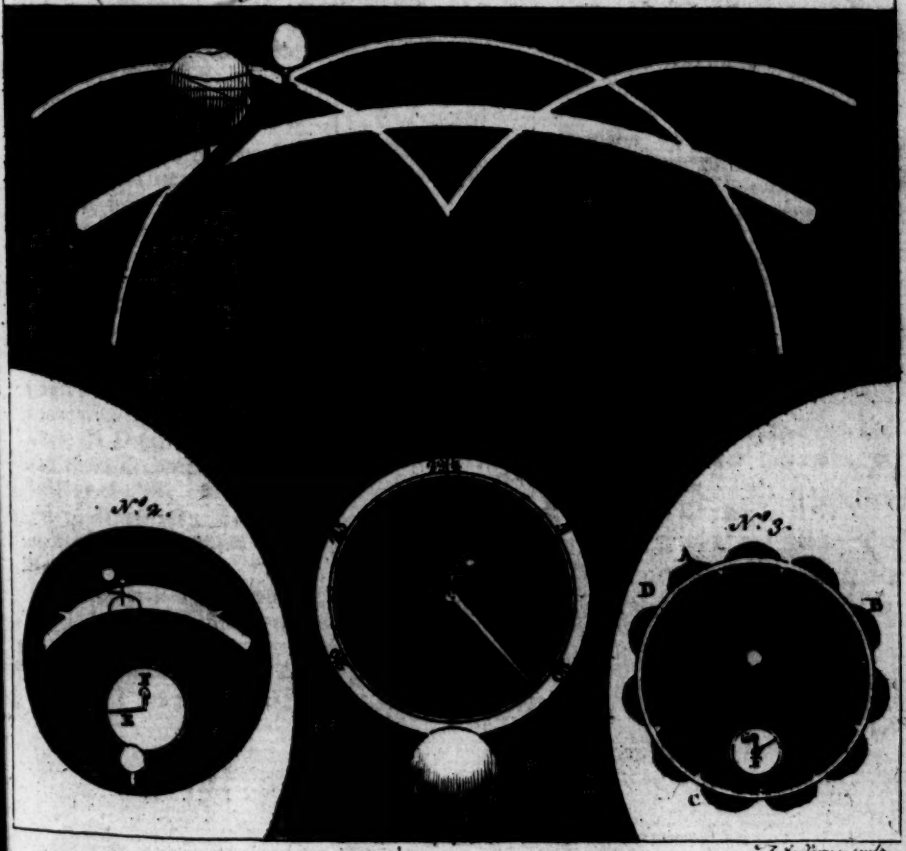
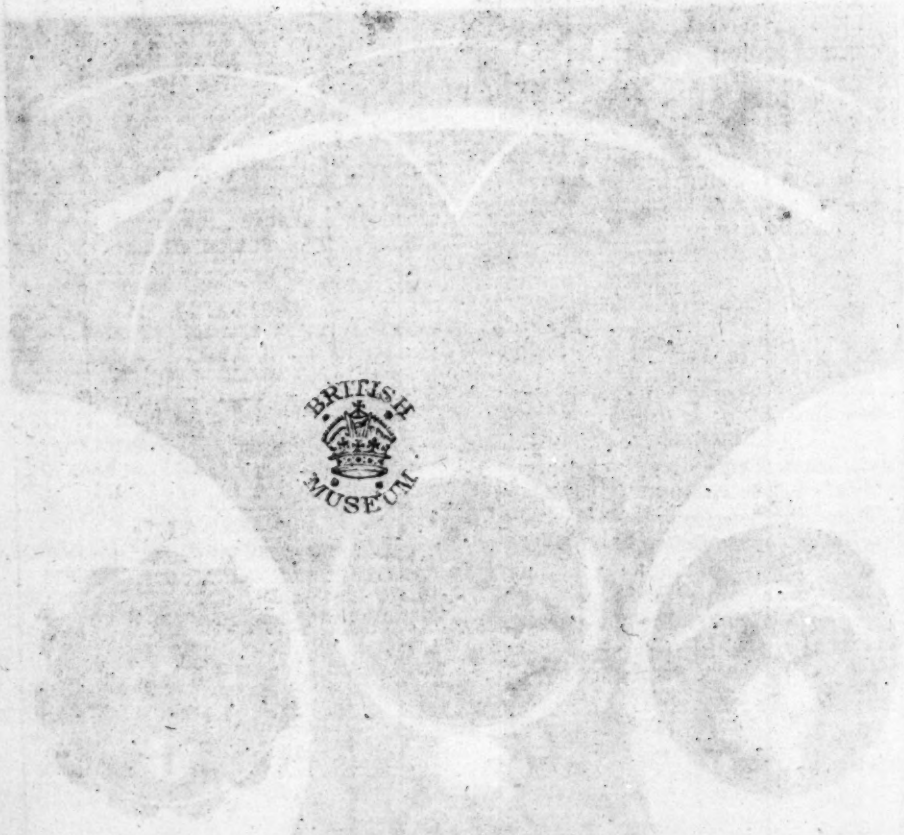


Fig. 3. PELECOIDES.

Fig. 2. The PATH of the Moon.



J. Jeffreys sculp.


BRITISH MUSEUM

upon the diameter EB deſcribe the circle EKB, meeting EL in K; take LO a third proportional to LK and LE, on the ſame ſide of L with LK; and O ſhall be the center of the curvature at L of the path, and LO the ray of curvature.

Becauſe EL and *el* are perpendicular to the path at the points L and *l*, let them be produced, and their ultimate interſection O ſhall be the center of curvature at L. Produce *qe* till it meet LE in V, join SV, and the angle $SeV = qea = LEA = SEV$; conſequently the angle $eVE = eSE$, the angle $EVS = eSE$, and the angle $EVS = EeS$, and SV is ultimately perpendicular to EO. Now the angle EO*e* is ultimately to EV*e* ($= ES e$) as EV to EO, that is (becauſe EV : EK :: ES : EB :: AS : AE) as EK × AS to EO × AE. But the angular motion of EL being equal to the angular motion of EA, while the circle EMF turns on the point E, LE*l* is therefore ultimately equal to AE*a*, which is to ES*e* as SA to AE; and EO*e* being to LE*l* as EL to LO, it follows that EO*e* : ES*e* :: SA × EL : AE × LO :: EK × SA : EO × AE. Therefore EL : LO :: EK : EO, and EL : LK :: LO : EL, or LK, LE and LO are in continued proportion. This theorem ſerves for determining the ray of curvature of epicycloids and cycloids of all ſorts; only when the baſe E*e* is a right line, AB vaniſhes, and EB becomes equal to EA.

Corol. I. When AL or AC is leſs than AB, then (becauſe LO is always on the ſame ſide of the point L with LK) the path is concave towards S throughout. When $AC = AB$, the curvature at the conjunction vaniſhes, or the path has there a point of rectitude. When AC is greater than AB (or $AS \times \frac{tt}{TT}$), a portion of the path near the conjunction is convex towards S, becauſe a part of the circle CLD falls within the circle BKE; and when L comes to either of the interſections of theſe circles, the path hath a point of contrary flexure. If $AC = AE$, theſe points meet again, and form a cuſp: and if $AC \sqsubset AE$, the path hath a nodus; which laſt is the caſe of the innermoſt of the ſatellites of jupiter and ſaturn.

Corol. II. In the caſe of the moon, $tt : TT :: 1 : 178$; and $AB = \frac{1}{178} \times AS$; but AC is about $\frac{1}{357} \times AS$; conſequently, $AC \sqsubset AB$, and the path of the moon is concave towards the ſun throughout.

Prop. III. Let AB : AS :: *tt* : TT, and the force, by which the path of the ſatellite can be deſcribed on an immoveable plane, is always directed to the point B *(ibid.)* upon the ray AS, and is always meaſured by BL, the diſtance of the ſatellite from the point B, the gravity of the primary towards the ſun being repreſented by BA.

We conceive the force by which this path could be deſcribed, on an immoveable plane, to be reſolved into a force that acts in the direction LO, perpendicular to the path, but has no effect on the velocity of the ſatellite; and a force perpendicular to LO, that accelerates or retards the motion of the ſatellite. The former of theſe is meaſured by LK, the latter by BK, the gravity of the primary towards the ſun being meaſured by AB. For the former is to the gravity of the primary towards S, as $\frac{EL^2}{LO}$ to $\frac{EA^2}{AS}$; (thoſe forces being directly as the ſquares of the velocities, and inverſely as the rays of curvature;) that is, as LK to AB, by prop. II. Therefore the gravity of the primary being repreſented by AB, the former force will be meaſured by LK.

The ſecond force that acts on the ſatellite in the direction of the tangent of its path, and accelerates or retards its motion, is as the fluxion of the velocity EL directly, and the fluxion of the time inverſely. The fluxion of the time is meaſured by $\frac{Aa}{EA}$ (A*a* being the arc deſcribed by the primary, and EA the velocity with which it is deſcribed) $= \frac{Ee}{EB} = \frac{rm}{EB} = \frac{lq \times AE}{EB \times AC}$ (ſuppoſing *an* and *qu* to be perpendiculars to *el* in *n* and *u*, becauſe *lq* : *lu* :: *ac* : *an*, or AC : AN) $\frac{AE \times lu}{BE \times AN} = \frac{lu}{BK}$. Therefore the force which is meaſured by *lu*, the fluxion of the velocity E*l*, or EL, divided by the fluxion of time, or $\frac{lu}{BK}$, is meaſured by BK. The force, therefore, in the direction LE being meaſured by LK, and the force in the perpendicular

lar direction K B by K B, the compounded force is measured by L B, and is directed from L to B.

It appears, from what has been demonstrated, that the path may be described by a force directed towards the point B (which is given upon the ray A S, but revolves along with this ray about S) or by any forces which, compounded together, generate a force tending to B, and always proportionable to L B, the distance of the satellite from B. Let L H be equal and parallel to A B, and A B H L shall be a parallelogram, and the force L B may be compounded of L H and L A; that is, the force L B may be the result of a force L H acting on the satellite, equal and parallel to A B, the gravity of the primary towards the sun, and of a force L A tending to the primary, and equal to the gravity by which the satellite would describe the circle C L D about the primary, in the same periodic time t, if the sun was away; because such a force is to the gravity of the primary towards the sun (represented by A B) as $\frac{AL}{tt}$ to $\frac{AS}{TT}$ or as A L to A S $\times \frac{tt}{TT} =$ A B.

Thus we arrive at the same conclusion which Sir Isaac Newton, more briefly, derived from an analysis of the motions of the satellite; that while the satellite gravitates towards the primary, if, at the same time, it be acted on by the same solar force as the primary, and with a parallel direction, it will revolve about the primary, in the same manner as if this last was at rest, and there was no solar action. These two forces, the gravitation towards the primary, and a force equal and parallel to the gravitation of the primary towards the sun, are exactly sufficient to account for the compounded motion of the satellite in its path, however complex a curved line it may appear to be. Nor is there any perturbation of the satellite's motion, but what arises from the inequality of the gravity of the satellite, and of the primary towards the sun, or from their not acting in parallel lines. If we should suppose them to move about their common center of gravity, while this is carried round the sun, or if we suppose the orbits to be elliptical, the conclusions will still be found consonant to what was more briefly deduced by this great author.

PATH *of the moon*, the tract described by the moon, while the earth describes its annual orbit. See EARTH and MOON.

The ingenious Mr. Neale having invented machines for illustrating this path of the moon, by means of which, the motion of that secondary planet, so difficult to be conceived by young students in astronomy, is rendered extremely easy and familiar, we shall here give the description of them. Fig. 2. plate CXCV. n° 1. represents the largest of these machines, containing the motion of the moon from the full to the new, and from the new to the full; and as the entire annual motion of that planet is only a repetition of the former, the machine is of the same utility as if it contained the whole path of the moon. A B represents part of the earth's annual orbit; D E F, part of that of the moon; T, the earth; M, the moon; $f G g$, the path described by the index f; S, the sun; H L, a circle divided into $29\frac{1}{2}$ equal parts, the number of days in a mean lunation; K, an index which moves on the center I, and points out the age of the moon. The machine is put in motion by the winch N; and while the earth describes the part of its orbit A B, the moon describes the curve F E D, exhibiting her several phænomena, as full, last quarter, new, first quarter, *&c.* Thus, when the moon is moved to E, the earth will be in C, exhibiting not only the phænomena of a new moon, but also that of a solar eclipse. In this position, the young student will easily apprehend the reason why the moon is not visible, unless there be an eclipse of the sun, as the sun and moon are then in the same right line, and only the dark part of the moon is turned towards the earth. By continuing the motion from thence to the full, the reason why the moon appears partly dark and partly light, will be rendered very conspicuous; the light part of the moon, represented by the white part of the ball, gradually emerging from a cap as she moves from the new to the full. When the moon is at D or F, the earth will be at A or B, and exhibit the phænomena of a full moon and lunar eclipse. In this position the whole white part of the ball will be turned without the cap and toward the sun; and therefore her whole face, which is turned towards the earth, will be illuminated, unless the sun's rays are intercepted by the earth, in which case there will be an eclipse of the moon.

By

By causing the moon to move from the full to the new, the reason of her decrease will be visible, the white part of the ball gradually immersing behind the cap, till she comes in opposition to the sun, and exhibits the phænomenon of a new moon. There is fixed an index near the stem of the moon, which shews her apparent motion in the ecliptic during her revolution round the earth, which is performed in a lunar month. By the help of this machine, an idea of the motion of the moon, and the curve she describes, may be obtained in an easy and entertaining manner. It will also appear evident, that her path is always concave towards the sun, notwithstanding her motion round the earth, an idea which, to beginners, has always been attended with difficulty.

N° 2. *ib.* represents another of these machines containing the moon's motion during one lunation, or from one new moon to another; where S, is the sun; A B, part of the earth's orbit; C, the moon; D, the earth; *a b*, a circle graduated into 29 ½ equal parts, the number of days in a mean lunar month; E, the index, shewing the moon's age on the quadrated circle *a b*; F, a button by which the machine is put in motion.

N° 3. *ibid.* is another of these machines, representing the whole annual path of the moon; S, the sun; D, the moon; E, the earth; A B C, the annual path of the moon; H I K L, the orbit of the earth; *a b*, a circle graduated into 29 ½, as in the other machines; F, the index shewing the moon's age; G, a button, whereby the machine is moved. The explanation we have given of n° 1. will be sufficient for forming an idea of the other two.

PATH *of the vertex*, a term frequently used by Mr. Flamsteed, in his doctrine of the sphere, for a circle described by any point of the earth's surface, as the earth turns round its axis: this point is considered as vertical to the earth's center, and is the same with the vertex or zenith in the ptolemaic projection.

The semi-diameter of this path is always equal to the sine of the complement of the latitude of the point that describes it.

PATHETIC, whatever relates to the passions, or that is proper to excite or awake them. See the article STYLE.

In music, this term is used for something very moving, expressive, or passionate, and is capable of exciting pity, compassion, anger, or the like. The chromatic genus, with its greater and lesser semitones, either ascending or descending, is very proper for the pathetic; as is also an artful management of discords, with a variety of motions now brisk, now languishing, now swift, now slow. Nieuwentyt mentions a musician of Venice, who excelled in the pathetic to such a degree, as to be able to play his auditors into distraction; he adds, that the great means he made use of, was the variety of his motions, *&c.*

PATHETIC NERVES, in anatomy, a pair of very small nerves which arise in the brain, and run to the trochlear muscle of the eye. These nerves have obtained the name pathetic, from their serving to move the eyes in the various passions.

PATHOGNOMONIC, παθογνομονικὸς, among physicians, an appellation for a symptom, or concourse of symptoms, that are inseparable from a distemper, and are found in that only, and in no other.

PATHOLOGY, that part of medicine, which explains the nature of diseases, their causes and symptoms.

PATHOS, πάθος, a greek term, literally signifying passion, is sometimes used for the energy of a discourse, or its power to move the passions.

PATIENT, among physicians, a person under the direction of a physician or surgeon, in order to be cured of some disease.

PATIENTIÆ MUSCULUS, in anatomy, the levator scapulæ. See LEVATOR.

PATMOS, one of the least of the islands of the Archipelago, subject to the Turks: east long. 27°, and north lat. 37°.

PATNA, a city of the hither India, the capital of the territory of the same name, in the province of Bengal: east longit. 85°, and north lat. 26°.

PATANCE, in heraldry, is a cross flory at the ends; from which it differs only in this, that the ends instead of turning down like a fleur de lis, are extended somewhat in the pattee-form. See the article FLORY.

PATOWMAC, a great river of Virginia, which arises in the Apalachian mountains, and after separating Virginia from Maryland, falls into the bay of Chesepeak.

PATRANA, or PASTRANA, a town of Spain, in the province of New Castile, forty miles east of Madrid.

PATRAS, a city and port-town of European

ropean Turky, in the province of the Morea: east long. 21° 30′, and north lat. 38° 20′.

PATRES CONSCRIPTI, CONSCRIPT FATHERS. See the articles CONSCRIPT and SENATOR.

PATRIARCHS, among Chriſtians, are eccleſiaſtical dignitaries, or biſhops, ſo called from their paternal authority in the church. The power of patriarchs was not the ſame in all, but differed according to the different cuſtoms of countries, or the pleaſures of kings and councils: thus the patriarch of Conſtantinople grew to be a patriarch over the patriarchs of Epheſus and Cæſarea, and was called the œcumenical and univerſal patriarch; and the patriarch of Alexandria had ſome prerogatives, which no other patriarch beſides himſelf enjoyed, ſuch as the right of conſecrating and approving every ſingle biſhop under his juriſdiction. The general privileges of the patriarchate were theſe following; 1. The patriarchs ordained all the metropolitans under them; but they themſelves were ordained by a dioceſan ſynod. 2. They had the power of convening all their metropolitans and provincial biſhops to a dioceſan ſynod. 3. They had the privilege of receiving appeals from metropolitans and provincial ſynods, and of reverſing their decrees. 4. They might enquire into the adminiſtration of metropolitans, and cenſure them in caſe of hereſy or miſdemeanor. 5. A patriarch had power to ſend a metropolitan into any part of his dioceſe as his commiſſioner, to hear and determine eccleſiaſtical cauſes in his name. 6. The metropolitans did nothing of moment without conſulting the patriarchs. 7. It was the patriarch's office to publiſh both eccleſiaſtical and civil laws, ſo far as concerned the church. 8. They were all co-ordinate, and independent of one another.

The title of patriarch is ſtill kept up in the greek church, the ſupreme head of which is the patriarch of Conſtantinople; who pays ſometimes ten, ſometimes twenty thouſand crowns to the grand-ſeignor for his inſtalment.

PATRIARCHAL CROSS, in heraldry, is that where the ſhaft is twice croſſed; the lower arms being longer than the upper ones. Plate CXCIV. fig. 7. is a patriarchal croſs, gules, on a field argent.

PATRICIAN, among the antient Romans, a title given to the deſcendants of the hundred, or, according to others, of the two hundred firſt ſenators choſen by Romulus, and by him called patres, fathers.

Romulus, ſays Kennet, as ſoon as his city was tolerably filled with inhabitants, made a diſtinction of the people, according to honour and quality, giving the better ſort the name of patres or patricii, and the reſt the common title of plebeii. To bind the two degrees more firmly together, he recommended to the patricians ſome of the plebeians, for them to protect and countenance; the former being ſtyled patrons, and the laſt clients. In difficult caſes, the patrons were always the counſellors of their clients, their advocates in judgments, and, in ſhort, their adviſers and overſeers in all affairs whatſoever. On the other hand, the clients faithfully ſerved the patrons, not only paying them all imaginable reſpect and deference; but, if occaſion required, aſſiſting them with money, towards defraying any extraordinary charges.

PATRIMONY, a right or eſtate inherited by a perſon from his anceſtors.

The term patrimony has been alſo given to church eſtates or revenues, in which ſenſe authors ſtill ſay, the patrimony of the church of Rimini, Milan, &c. The church of Rome had patrimonies in France, Africa, Sicily and many other countries. To create the greater reſpect to the eſtates belonging to the church, it was uſual to give their patrimonies the names of the ſaints they held in the higheſt veneration: thus the eſtate of the church of Ravenna was called the patrimony of St. Apollinarius; that of Milan, the patrimony of St. Ambroſe; and the Eſtates of the roman church were called the patrimony of St. Peter in Abruzzo, the patrimony of St. Peter in Sicily, and the like.

What is now called St. Peter's patrimony is only the dutchy of Caſtro, and the territory of Orvietto. See CASTRO, &c.

PATRINGTON, a market-town of Yorkſhire, ſituated at the mouth of the Humber, fifty miles eaſt of York.

PATRIPASSIANS, *patripaſſiani*, in church-hiſtory, a chriſtian ſect, who appeared about the latter end of the IId century; ſo called from their aſcribing the paſſion to the Father: for they aſſerted the unity of God in ſuch a manner as to deſtroy all diſtinction of perſons, and to make the Father and Son preciſely the ſame; in which they were followed by the

Sabellians,

ſabellians, and others. The author and head of the patripaſſians was Praxeas, a philoſopher of Phrygia in Aſia.

PATROL, in war, a round or march made by the guards, or watch, in the night-time, to obſerve what paſſes in the ſtreets, and to ſecure the peace and tranquillity of a city or camp. The patrol generally conſiſts of a body of five or ſix men, detached from a body on guard, and commanded by a ſerjeant.

PATRON, among the Romans, was an appellation given to a maſter who had freed his ſlave. As ſoon as the relation of maſter expired, that of patron began; for the Romans in giving the ſlaves their freedom, did not deſpoil themſelves of all right and privileges in them; the law ſtill ſubjected them to conſiderable ſervices and duties towards their patrons, the neglect of which was very ſeverely puniſhed.

Patron was alſo a name which the people of Rome gave to ſome great man, under whoſe protection they uſually put themſelves; paying him all kinds of honour and reſpect, and denominating themſelves his clients; while the patron, on his ſide, granted them his credit and protection.

PATRON, in the church of Rome, a ſaint, whoſe name a perſon bears, or under whoſe protection he is put, and whom he takes particular care to invoke: or a ſaint, in whoſe name a church or order is founded.

PATRON, in the canon and common law, is a perſon, who having the advowſon of a parſonage, vicarage, or the like ſpiritual promotion, belonging to his manor, hath, on that account, the gift and diſpoſition of the benefice, and may preſent to it whenever it becomes vacant. The patron's right of diſpoſing of a benefice, originally ariſes either from the patron, or his anceſtors, *&c.* being the founders or builders of the church; from their having given lands for the maintenance thereof; or, from the church's being built on their ground; and, frequently, from all three together.

PATRONAGE, the right of diſpoſing of a church or benefice, and enjoying ſeveral other privileges, ſuch as having the honourable rights of the church being interred in the chancel, *&c.* See the article ADVOWSON and PATRON.

Arms of PATRONAGE, in heraldry, are thoſe on the top of which are ſome marks of ſubjection and dependance: thus the city of Paris bears the fleurs de lis in chief, to ſhew her ſubjection to the king; and the cardinals, on the top of their arms, bear thoſe of the pope, who gave them the hat, to ſhew that they are his creatures.

PATRONYMIC, among grammarians, is applied to ſuch names of men and women as are derived from thoſe of parents or anceſtors.

Patronymics are derived, 1. From the father, as Pelides, *i. e.* Achilles the ſon of Peleus. 2. From the mother, as Philyrides, *i. e.* Chiron the ſon of Philyra. 3. From the grandfather on the father's ſide, as Æacides, *i. e.* Achilles the grandſon of Æacus. 4. From the grandfather by the mother's ſide, as Atlantiades, *i. e.* Mercury the grandſon of Atlas. And, 5. From kings and founders of nations, as Romulidæ, *i. e.* the Romans from their founder king Romulus.

The termination of greek and latin patronymics are chiefly four, *viz. des*, of which we have examples above; *as*, as Thaumantias, *i. e.* Iris the daughter of Thaumas; *is*, as Atlantis, *i. e.* Electra the daughter of Atlas; and *ne*, as Nerine, the daughter of Nereus. Of theſe terminations *des* is maſculine; and *as*, *is*, and *ne*, feminine: *des* and *ne* are of the firſt declenſion, *as* and *is* of the third.

PATTI, a port-town of Sicily, in the province of Val Demona, ſituated on the Mediterranean, forty-ſix miles weſt of Meſſina.

PAU, a city of France, in the province of Gaſcony and territory of Bearne, ſituated on the river Gave, thirty-ſix miles ſouth-eaſt of Bayonne.

PAVAGE, in our old law-books, ſignifies money paid towards paving the ſtreets or highway.

PAVAN, a grave kind of dance, borrowed from the Spaniards, wherein the performers make a kind of wheel, or tail, before each other, like that of a peacock; whence the name.

PAVEMENT, a layer of ſtone, or other matter, ſerving to cover and ſtrengthen the ground of divers places for the more commodious walking on.

In England the pavements of the grand ſtreets, *&c.* are uſually of pebbles; courts, ſtables, kitchens, halls, churches, *&c.* are paved uſually with tiles, bricks, flags, or fire ſtones; and ſometimes with a kind of free-ſtone and rag-ſtone. In

France the public roads, ſtreets, courts, &c. are paved with gres, a kind of free-ſtone. In Venice the ſtreets, &c. are paved with brick; churches ſometimes with marble, and ſometimes with moſaic work. In Amſterdam and the chief cities of Holland, they call their brick pavement the burger-maſters pavement, to diſtinguiſh it from the ſtone or flint pavement, which is uſually in the middle of the ſtreet, ſerving for the paſſage of their horſes, carts, coaches, and other carriages; the brick borders being deſigned for the paſſage of people on foot.

Pavements of free-ſtone, flints, and flags, in ſtreets, &c. are laid dry, that is, are retained in a bed of ſand; thoſe of courts, ſtables, ground-rooms, &c. are laid in mortar of lime and ſand, or in lime and cæment, eſpecially if there be vaults or cellars underneath: ſome maſons, after laying a floor dry, eſpecially of brick, ſpread a thin mortar over it, ſweeping it backwards and forwards, to fill up the joints. Thirty-two ſtatute bricks laid flat, pave a yard ſquare; ſixty-four of edge-wiſe. See the article BRICK.

The ſquare tiles uſed in paving, called paving-bricks, are of various ſizes, from ſix to twelve inches ſquare. Pavements of churches, &c. frequently conſiſt of ſtones of different colours chiefly black and white; and of ſeveral forms, but chiefly ſquare and lozenges, artfully diſpoſed.

PAVEMENT *of terrace*, is that which ſerves for the covering of a platform, whether it be over a vault, or on a wooden-floor. Thoſe over vaults are uſually ſtones ſquared, and bedded in lead. Thoſe on wood are either ſtones with beds, for bridges; tiles for ceilings in rooms; or lays of mortar, made of cæment and lime, with flints or bricks laid flat, as is ſtill practiſed by people in the eaſt and ſouth, on the tops of their houſes.

Moſaic PAVEMENT. See MOSAIC-WORK.

Teſſelated PAVEMENT. See TESSELATED.

PAVETTA, in botany, a genus of the tetrandria-monogynia claſs of plants, with a monopetalous funnel-faſhioned flower, and a monoſpermous berry for its fruit.

PAVIA, a city of Italy, in the dutchy of Milan, capital of the Paveſan, the ſee of a biſhop, and univerſity, ſituated in eaſt long. 9° 40′, and north lat. 45° 15′.

PAVIA, in botany, a genus of the octandria-monogynia claſs of plants, the corolla whereof conſiſts of five roundiſh petals, the upper ones being longer than the reſt, and all of them inſerted into the cup by very long ungues; the fruit is coriaceous, turbinated, obtuſely tetragonal, made up of four valves, and containing four cells; the ſeeds are ſolitary and roundiſh.

PAVICULA, among the Romans, a rammer or inſtrument for beating down or levelling a ſpot of ground, conſiſting of a block of wood, a foot long, and half a foot thick, with a long handle.

PAVILION, in architecture, ſignifies a kind of turret or building, uſually inſulated, and contained under a ſingle roof; ſometimes ſquare, and ſometimes in form of a dome: thus called from the reſemblance of its roof to a tent.

Pavilions are ſometimes alſo projecting pieces, in the front of a building, marking the middle thereof; ſometimes the pavilion flanks a corner, in which caſe it is called an angular pavilion. The Louvre is flanked with four pavilions: the pavilions are uſually higher than the reſt of the building. There are pavilions built in gardens, commonly called ſummer-houſes, pleaſure houſes, &c. Some caſtles or forts conſiſt only of a ſingle pavilion.

PAVILION, in military affairs, ſignifies a tent raiſed on poſts, to lodge under in the ſummer time. See the article TENT.

PAVILION is alſo ſometimes applied to flags, colours, enſigns, ſtandards, banners, &c. See the articles FLAG, &c.

PAVILION, in heraldry, denotes a covering in form of a tent, which inveſts or wraps up the armories of divers kings and ſovereigns, depending only on God and their ſword.

The pavilion conſiſts of two parts; the top which is the chapeau, or coronet; and the curtin, which makes the mantle. None but ſovereign monarchs, according to the french heralds, may bear the pavilion entire, and in all its parts. Thoſe who are elective, or have any dependance, ſay the heralds, muſt take off the head, and retain nothing but the curtains.

PAVILIONS, among jewellers, the underſides and corners of the brilliants, lying between the girdle and the collet.

St. PAUL *de Leon*, a port-town of France, in the province of Britany, ſituated at the entrance of the Engliſh channel, in weſt long. 4°, and north lat. 49°.

St. PAUL, a town of France, in the pro-

vince

vince of Dauphiné, ſituated on the eaſt ſide of the river Rhone, twelve miles north of Orange.

St. PAUL is alſo a city of Braſil, in South America, in the province of St. Vincent, ſituated in weſt long. 50°, and ſouth lat. 23° 30′.

PAULIONISTS, in church-hiſtory, chriſtian heretics of the IIId century, diſciples of Paul Samoſatenſis, biſhop of Antioch, who denied Chriſt's divinity, maintaining that when we call him the Son of God, we do not thereby mean that he is really and truly God; but only that he was ſo perfect a man, and ſo ſuperior in virtue to all others, that he had this name given him by way of eminence. The paulioniſts continued to the Vth century, notwithſtanding the prohibition of the emperor Conſtantine the great, who forbad them and other heretics to hold public aſſemblies.

PAULICIANS, chriſtian heretics of the VIIth century, diſciples of one Conſtantine, a native of Armenia, and a favourer of the errors of Manes; who, as the name manichees was become odious to all nations, gave thoſe of his ſect the title of Paulicians, on pretence that they followed only the doctrine of St. Paul. One of their moſt deteſtable maxims was, not to give alms to the poor, that they might not contribute to the ſupport of creatures, who were the works of the bad god. See the article MANICHEES.

PAULLINIA, in botany, a genus of the octandria-digynia claſs of plants, the corolla whereof conſiſts of four oblong petals, of an obverſely oval figure, patent, and twice as large at the cup: the fruit is a large triquetrous capſule, formed of three valves, and containing three cells; the ſeeds are ſingle, and of an oval figure.

PAUNCH, PANTCH, or PANCH, on board a ſhip, are broad clouts, woven of thrums and ſinnets together, to ſave things from galling and fretting; therefore they are made faſt to the main and fore-yards for that purpoſe.

PAVO, in zoology. See PEACOCK.

PAVO, in aſtronomy, a ſouthern conſtellation, called the peacock.

PAUPER, in law. See the article FORMA PAUPERIS.

PAURAEDRASTYLÆ, in natural hiſtory, the name of a genus of perfect cryſtals, with double pyramids, and no intermediate column, compoſed of twelve planes, or two hexangular pyramids, joined baſe to baſe. See CRYSTAL.

PAUSANIA, in grecian antiquity, a feſtival, in which were ſolemn games, wherein nobody contended but free-born Spartans; in honour of Pauſanias, the ſpartan general, under whoſe conduct the Greeks overcame Mardonius, in the famous battle at Plateæ: there was always an oration in honour of Pauſanias.

PAUSARY, *pauſarius*, in roman antiquity, an officer, who, in the ſolemn pomps or proceſſions of the goddeſs Iſis, directed the ſtops or pauſes. In theſe ceremonies there were frequent ſtands at places prepared for the purpoſe, wherein the ſtatues of Iſis and Anubis were ſet down; much after the manner of the reſting-places in the proceſſion of the holy ſacrament, in the romiſh church: the reſt were called manſiones.

PAUSARY was alſo the name of an officer in the roman gallies, who gave the ſignal to the rowers, and marked the times and pauſes, to the end they might act in concert, and row all together: this was done with a muſical inſtrument.

PAUSE, a ſtop or ceſſation of ſpeaking, ſinging, playing, or the like. The uſe of pointing in grammar, is to make proper pauſes, in certain places. There is a pauſe in the middle of each verſe; in an hemiſtich it is called a reſt or repoſe. See the article REST.

PAUSE, in muſic, a character of ſilence, or reſt, called alſo by ſome a mute figure; becauſe it ſhews that ſome part or perſon is to be ſilent, while the reſt continue the ſong. Pauſes are uſed either for the ſake of ſome fugue or imitation, or to give a breathing time; or to give room for another voice, *&c.* to anſwer what this part ſung, as in dialogues, echoes, *&c.* General pauſe denotes a general ceſſation or ſilence of all the parts; and demi-pauſe, a ceſſation for the time of half a meaſure. They alſo ſay, pauſe of a minim, pauſe of a ſemibreve, long pauſe, pauſes of a croma and ſemicroma, being names given by the Italians, to expreſs the different values or duration of pauſes for the ſigns of which, ſee the article CHARACTER.

PAW, PATTE, in heraldry, the fore-foot of a beaſt, cut off ſhort. If the leg be cut off, it is called gambe. Lions paws are much uſed in armory.

PAW, in the manege. A horſe is ſaid to paw the ground, when his leg, being either

either tired or painful, he does not reſt it upon the ground, and fears to hurt himſelf as he walks.

PAWLE, in a ſhip, a ſmall piece of iron bolted to one end of the beams of the deck, cloſe to the capſtan; but yet ſo eaſily, as that it can turn about. Its uſe is to ſtop the capſtan from turning back, by being made to catch hold of the whelps: they therefore ſay, heave a pawle; that is, heave a little more, for the pawle to get hold of the whelps: and this they call pawling the capſtan.

PAWN, a pledge lodged for the ſecurity of the payment of a ſum of money borrowed. As the party that pawns the goods, has a general property therein, they cannot be forfeited by the perſon that hath them in pawn, for any offence of his; neither can they be taken in execution for his debt: on the other hand, where goods are repawned for money, if, after judgment is obtained againſt the pawner for debt, the goods in the pawnee's hands, are not liable to execution until ſuch time as the money lent be paid to the pawnee. He that borrows money on a pawn, is to have again the pledge, when he repays the ſame; or he may bring an action for detaining it; and his very tender of the money reveſts the ſpecial property in him. Likewiſe it has been held, that where a broker refuſes, on tendering the money, to redeliver the goods, he thereupon ſhall be indicted. In caſe goods are pawned for lent money, and no day fixed for their redemption, they are ſaid to be redeemable at any time during the pawner's life; and though they may not be redeemed after his death, they may after the death of the pawnee. Where the pawn is redeemable on a certain day, it muſt be ſtrictly obſerved, or upon failure of payment it may be ſold. Alſo it is the common practice of the brokers, when no day is fixed for redemption, not to ſtay longer than a year for their money, at the expiration of which time they uſually ſell the goods.

PAWN, among miners, a pledge put into the bar-maſter's hand, at the time when the plaintiff cauſes the bar-maſter to arreſt the mine.

PAWN-BROKER. See the article BROKER.

PAX, PEACE. See the article PEACE.

PAY, in the ſea-language. The ſeamen ſay, pay more cable, when they mean to let out more cable.

PAYING, among ſeamen. When the ſeams of a ſhip are laid over with a coat of hot pitch, it is called paying her; and when this is done with canvas, pareling: alſo when, after ſhe is graved, and the ſoil burned off, a new coat of tallow and ſoap, or one of train-oil, roſin, and brimſtone boiled together, is put on her, that is alſo called paying of a ſhip.

PAYMENT, the diſcharge of a debt, either by money really told, or by bills of exchange, *&c.* See the article DEBT. The manner of payment ſhall be directed by him that pays the money, and not by the receiver of it. If money be paid before the time, it is, in law, accounted a payment at the day; and here the payment of a leſſer ſum may be a ſatisfaction for the whole, though not otherwiſe.

PAZ, a city of Peru in South America, ſituated on the eaſt ſide of the lake Titicaca: weſt long. 66°, and ſouth lat. 18°.

PEA, *piſum*, in botany. See PISUM.

PEACE, *pax*, in its general ſignification, ſtands in contradiſtinction to war.

Peace, in our law-books, ſignifies a quiet and inoffenſive behaviour towards the king and his people. It is obſerved, that all authority for keeping the peace comes originally from the king, who is the ſupreme officer or magiſtrate for the preſervation of it. Alſo the lord-chancellor and judges of the king's bench, *&c.* have a general power to keep the peace over all the realm; as have likewiſe all courts of record within their own precincts, and ſheriffs of counties, juſtices of the peace, conſtables, *&c.* No perſon may break the peace without being liable to puniſhment; and where any perſon is in danger of harm, or ſome bodily prejudice from another, on oath made thereof before a juſtice of the peace, or other magiſtrate, he may be ſecured by bond or recognizance, which is commonly called binding to the peace.

PEACE *of the king*, is that peace or ſecurity, both of life and goods, which the king promiſes to all his ſubjects, or others that are under his protection. There is alſo the peace of the king's highways, which is to be free from all annoyance and moleſtation; to which may be added the peace of the plough, whereby both the plough and plough-cattle are ſecured from diſtreſſes; and fairs are ſaid to have their peace, ſo that no perſon may be troubled there for debts contracted elſewhere.

PEACH, in botany. See PERSICA.

PEACOCK, *pavo*, in ornithology, a genus of birds, of the order of the gallinæ, the

the characters of which are these: there are four toes on each foot, and the head is ornamented with an erect crest of feathers.

Of this genus there are several species, distinguished by their different colours. The male of the common kind is, perhaps, the most gaudy of all the bird-kind; the length and beauty of whose tail, and the various forms in which the creature carries it, are sufficiently known and admired.

PEACOCK-FISH, *pavo*, in ichthyology, a very beautiful species of labrus, with the pectoral fins round at the extremity, and so called from its beautiful variety of colours, as red, blue, yellow, brown, &c. It grows sometimes to more than three pounds in weight. See plate CXCIV. fig. 9.

PEAK, a rocky mountainous country in the west of Derbyshire, remarkable for its mines of lead and iron, &c.

PEAN, in heraldry, is when the field of a coat of arms is sable, and the powderings or.

PEAR, *pyrus*, in botany. See PYRUS.

PEARCH, in ichthyology, the same with perca. See the article PERCA.

PEARCH-FISHING. See FISHING.

PEARCH-GLUE, the name of a kind of glue of remarkable strength and purity, made from the skins of pearches. See the article GLUE.

PEARL, *margarita*, in natural history, a hard, white, shining body, usually roundish, found in a testaceous fish resembling an oyster.

Pearls, though esteemed of the number of gems of our jewellers, and highly valued, not only at this time, but in all ages, proceed only from a distemper in the creature that produces them, analogous to the bezoars, and other stony concretions in several animals of other kinds; and what the antients imagined to be a drop of dew concreted into a pearl in the body of the pearl-fish, which they supposed rose from the bottom to the surface of the water to receive it, is nothing more than the water destined to form and enlarge the shell, bursting from the vessels destined to carry it to the parts of the shell it should have formed, and by that means producing these little concretions.

The fish in which these are usually produced is the East-Indian pearl-oyster, as it is commonly, though not very properly, called; it has a very large and broad shell of the bivalve kind, sometimes measuring twelve or fourteen inches over, but those of eight inches are more frequent: it is not very deep; on the outside it is of a dusky brown, and within of a very beautiful white, with tinges of several other colours, as exposed in different directions to the light. Besides this shell, there are many others that are found to produce pearls; as the common oyster, the muscle, the pinna marina, and several others, the pearls of which are often very good, but those of the true indian berberi, or pearl-oyster, are in general superior to all. The small or seed-pearls, also called ounce pearls, from their being sold by the ounce, and not by tale, are vastly the most numerous and common; but as in diamonds, among the multitudes of small ones, there are smaller numbers of larger found, so in pearls there are larger and larger kinds; but as they increase in size, they are proportionably less frequent, and this is one reason of their great price. We have scotch pearls frequently as big as a little tare, some as big as a large pea, and some few of the size of a horse-bean; but these are usually of a bad shape, and of little value in proportion to their weight. Philip II. of Spain had a pearl perfect in its shape and colour, and of the size of a pigeon's egg. De Boot tells us of one in the emperor Rudolph's possession, of thirty carrats weight; Tavernier mentions one in Persia, for which that crown paid to the amount of more than a hundred thousand pounds sterling; and we are told of Cleopatra's possessing one worth fourscore thousand pounds of our money: pearls of such vast sizes as these, are as rare as the great diamonds; but, as among diamonds, there are a considerable number, which though very short of this, are of great value. The finest, and what is called the true shape of the pearl, is a perfect round; but if pearls of a considerable size are of the shape of a pear, as is not unfrequently the case, they are not less valued, as they serve for earrings and other ornaments. Their colour ought to be a pure white, and that not a dead and lifeless, but a clear and brilliant one; they must be perfectly free from any foulness, spot or stain, and their surfaces must be naturally smooth and glossy, for they bring their natural polish with them, which art is not able to improve.

All

All pearls are formed of the matter of the ſhell, and conſiſt of a number of coats ſpread with perfect regularity one over another, in the manner of the ſeveral coats of an onion, or like the ſeveral ſtrata of the ſtones found in the bladders or ſtomachs of animals, only much thinner. It is obſerved that the whiteſt pearls, brought into Europe, contract a yellowneſs on the ſurface, which no art can recover; but there is a way of taking off the whole outer coat of the pearl, in which caſe the ſecond ſurface, which is as bright as the originally external one, preſerves its beauty for a long time. This, however, is a very nice operation to perform, and at beſt greatly diminiſhes the value of the pearl by taking from its ſize and weight. It is ſaid that thoſe pearls which have ſomewhat of a yellowiſh caſt never alter, nor ever loſe their luſtre; and if this be true, the antients, who preferred thoſe which were a little yellowiſh to the perfectly white ones, had great reaſon on their ſide.

The little protuberances, like warts, which we ſee riſing in hemiſpherical figures from the ſurfaces of ſhells, are evidently of the pearl-kind, only not detached: when theſe are of a good colour, and tolerably large, our workmen cut them out, and make ſomething of them under the name of wens of pearls.

This valuable article of commerce is not the product of any peculiar part of the world. The Eaſt-Indies and America produce the pearl ſhell-fiſh in abundance, and it is found with good pearls in many parts of Europe. The coaſts of the iſland Ceylon afford pearls ſuperior to thoſe of all the Eaſt in the beauty of their colour, but there are no very large ones found there. The Perſian gulph abounds with the pearl-fiſh, and fiſheries are eſtabliſhed on the coaſts of the ſeveral iſlands in it. In America, there are fiſheries in the gulph of Mexico, and along the coaſt of Terra Firma, all which yield conſiderable advantage. The european pearls are principally found on the coaſts of Scotland, and the neighbouring parts.

The pearls met with in apothecaries ſhops are of various kinds, all that are unfit for the jewellers purpoſes coming thither; conſequently ſome of the rough and ill ſhaped pearls, and thoſe of bad colours, are at times to be met with there; though the generality are what are only too ſmall for working into toys, &c. Theſe, after levigation, make an impalpable powder, which is much talked of as an ingredient in what is called pearl-cordials; but moſt of the apothecaries uſe only levigated oyſter-ſhell under its name. Great praiſes have, indeed, been given to pearls as cordials and ſudorifics; but without any great foundation: for they ſeem mere alkaline abſorbents, and as good as crabs-eyes, or oyſter-ſhells, but not better.

Diamonds, pearls, rubies, and all other jewels, are imported duty free, only levigated or beaten pearls pay, on importation, 7¾d. the ounce troy; and draw back, on exportation, $6\frac{80}{100}$d.

Manner of fiſhing for PEARLS *in the Eaſt-Indies.* There are two ſeaſons for pearl-fiſhing, the firſt is in March and April, and the laſt in Auguſt and September; and the more rain there falls in the year, the more plentiful are theſe fiſheries. At the beginning of the ſeaſon there are ſometimes two hundred and fifty barks on the banks; the larger barks having two divers, and the ſmaller one. Each bark puts off from ſhore at ſun-riſe, with a land-breeze, which never fails; and returns again by a ſea-breeze, which ſucceeds it about noon. As ſoon as the barks arrive at the place where the fiſh lie, and have caſt anchor, each diver binds a ſtone ſix inches thick, and a foot long, under his body; which ſerves him as ballaſt, prevents his being driven away by the motion of the water, and enables him to walk more ſteadily under the waves. They alſo tie another very heavy ſtone to one foot, by which they are very ſpeedily ſent to the bottom of the ſea: and as the oyſters are uſually firmly faſtened to the rocks, they arm their hands with leather-mittens to prevent their being wounded in pulling them violently off; but this taſk ſome perform with an iron-rake. In the laſt place, each diver carries down with him a large net in the manner of a ſack, tied to his neck by a long cord, the other end of which is faſtened to the ſide of the bark. This net is to hold the oyſters gathered from the rock, and the cord is to pull up the diver when his bag is full, or he wants air. See DIVING.

In this equipage he ſometimes precipitates himſelf ſixty feet under water; and as he has no time to loſe, he no ſooner arrives at the bottom, than he begins to run from ſide to ſide tearing up all the oyſters he meets with, and cramming them into his budget.

At

At whatever depth the divers are, the light is ſo great, that they eaſily ſee whatever paſſes in the ſea: and to their great conſternation ſometimes perceive monſtrous fiſhes, from which all their addreſs in mudding the water, *&c.* will not always ſave them, but they unhappily become their prey: and of all the dangers of the fiſhery, this is one of the greateſt and moſt uſual. The beſt divers will keep under water near half an hour, and the reſt do not ſtay leſs than a quarter. During this time they hold their breath without the uſe of oils, or any other liquors; only acquiring the habit by long practice. When they find themſelves ſtreightened they pull the rope to which the bag is faſtened, and hold faſt by it with both hands; when thoſe in the bark, taking the ſignal, heave them up into the air, and unload them of their fiſh, which is ſometimes five hundred oyſters, and ſometimes not above fifty. Some of the divers need a moment's reſpite to recover breath; others jump in again inſtantly, continuing this violent exerciſe without intermiſſion for ſeveral hours.

On the ſhore they unload their barks, and lay their oyſters in an infinite number of little pits dug in the ſand four or five feet ſquare; raiſing heaps of ſand over them to the height of a man; and in this condition they are left, till the rain, wind, and ſun have obliged them to open, which ſoon kills them: upon this the fleſh rots and dries, and the pearls, thus diſengaged, fall into the pit, on their taking out the ſhells. After clearing the pits of the groſſer filth, they ſift the ſand ſeveral times in order to find the pearls: but whatever care they take, they always loſe a great many. After cleaning and drying the pearls, they are paſſed through a kind of ſieve, according to their ſizes: the ſmalleſt are then ſold as ſeed-pearls; and the reſt put up to auction, and ſold to the higheſt bidder.

Artificial PEARLS, are made by reducing ſeed-pearls to a paſte, by means of a chemical preparation called mercurial water, making the beads in ſilver-moulds, boring them with a hog's briſtle, and drying them in a cloſed glaſs in the ſun.

Beads, in imitation of pearls, are alſo made of wax, and covered with the ſcales of ſeveral kinds of fiſhes.

Mother of PEARL, is the ſhell not of the pearl-oyſter, but of another ſea-fiſh of the oyſter-kind. This ſhell on the inſide is extremely ſmooth, and of the whiteneſs and water of pearl itſelf; and it has the ſame luſtre on the outſide, after the firſt laminæ or ſcales have been cleared off with aquaſortis, and the lapidaries mill. Mother of pearl is uſed in inlaid-works, and in ſeveral toys, as ſnuff-boxes, *&c.*

PEARL, in heraldry, in blazoning with precious ſtones, is the ſame with argent, or white.

PEARL, PIN, or WEB, in medicine, an exceſcence growing in the eye. See the article UNGUIS.

PEARL-FISH, *rhombus*. See RHOMBUS.

PEARL-FORT, a fortreſs in dutch Brabant, ſituated on the river Scheld, four miles north-weſt of Antwerp.

PEARL-ISLANDS, ſeveral ſmall iſlands ſituated in the bay of Panama: weſt long. 81°, and between 7° and 9° of north lat.

PEAT, a kind of turf uſed for fuel in ſeveral countries. See the article MOSS. In Holland they have a way of charring peat, ſo that it may ſerve for fuel in ſeveral chemical operations; but this manner of charring is not yet known in ſeveral countries where, perhaps, peat might be found.

PEBBLES, the name of a genus of foſſils, diſtinguiſhed from the flints and homochroa, by their having a variety of colours. Theſe are defined to be ſtones, compoſed of a cryſtalline matter, debaſed by earths of various kinds in the ſame ſpecies, and then ſubject to veins, clouds, and other variegations; uſually formed by incruſtations round a central nucleus, but ſometimes the effect of a ſimple concretion, and veined like the agates, by the diſpoſition the motion of the fluid they were formed in gave their differently coloured ſubſtances. Dr. Hill obſerves, that the variety of pebbles, were it of England alone, is ſo great, that a haſty deſcriber would be apt to make almoſt as many ſpecies as he ſaw ſpecimens. A careful examination will teach us, however, to diſtinguiſh them into a certain number of eſſentially different ſpecies, to which all the reſt may be referred, as accidental variations. When we find the ſame ſubſtances and the ſame colours, or thoſe reſulting from a mixture of the ſame, ſuch as nature frequently makes in a number of ſtones, we ſhall eaſily be able to determine, that theſe are all of the ſame ſpecies, though in different appearances; and that whether matter be diſpoſed in one or two, or

in twenty cruſts, laid regularly round a central nucleus, or thrown without a nucleus into irregular lines, or finally, blended into a ſort of uniform maſs.

Theſe are the three ſtates in which we are liable to find every ſpecies of pebble; for if it have been moſt naturally and regularly formed by incruſtation round a central nucleus, we find that ever the ſame in the ſame ſpecies, and the cruſts not leſs regular and certain. If the whole have been more haſtily formed, and have been the reſult only of one ſimple concretion, if that has happened while its different ſubſtances were all moiſt and thin, they have blended together and made a mixed maſs of the joint-colour of them all; but if they have been ſomething harder when this has happened, and too far concreted to diffuſe wholly among one another, they are found thrown together in irregular veins. Theſe are the natural differences of all the pebbles; and having regard to theſe in the ſeveral variegations, all the known pebbles may be reduced to thirty-four ſpecies; for an account of each, we refer the curious to Hill's hiſtory of foſſils, p. 512, ſeq.

There are many people of opinion, that the ſwallowing of pebbles is very beneficial to health, in helping the ſtomach to digeſt its food; and a pebble-poſſet is an old woman's medicine in the cholic in many parts of England. They uſually order the ſmall white ſtones to be picked up out of gravel-walks for this purpoſe, and eat them in large quantities in ſome ſort of ſpoon-meat, of which milk is an ingredient: however this cuſtom may ſtill prevail, we have no phyſician's practice to warrant it, and could produce inſtances of much miſchief reſulting from ſwallowing of pebbles; a markable one whereof the reader may find recorded in the philoſophical tranſactions, n° 253.

PECCANT, in medicine, a term uſed for thoſe humours of the body which offend either by their quantity or quality.

PECK, a meaſure of capacity, four of which make a buſhel. See the articles MEASURE and BUSHEL.

PECORA, in natural hiſtory, a claſs of quadrupeds, the characters of which are, that they have no foreteeth in the upper-jaw; thoſe in the lower are ſix, or eight; the feet are covered with divided hoofs; and the teats are two, and are ſituated in the groin.

To this claſs of animals belong the dromedary, the camel, the moſchus, the cervus or ſtag, the capra or goat, the ſheep, the ox, &c.

PECQUENCOUR, a town of the french Netherlands, in the province of Hainalt, five miles eaſt of Doway.

PECTEN, a genus of bivalve ſhells, ſhutting cloſe all round, and uſually of a depreſſed form; but it is always aurited, or having one or two proceſſes, called ears, iſſuing from the head of the ſhell near the hinge.

The greater part of the pectens are ſtriated, or coſtated; the ribs or ridges running in ſtraight lines like the teeth of a comb; whence the name.

There are a great many elegant ſpecies of this genus; as the ducal mantle-ſhell, or pecten variegated with red and yellow, and a few ribs; the iriſh ſcallop-ſhell, or red pecten variegated with white, &c.

PECTORAL, an epithet for medicines good for diſorders of the breaſt and lungs.

The ordinary intentions of theſe medicines is either to attenuate or thicken the humours of theſe parts, and to render them fit to be expectorated or ſpit out. See the article EXPECTORANTS.

The pectoral decoction, as altered by the college of phyſicians, is as follows: take barley, raiſins ſtoned, figs, of each two ounces; of liquorice-root, half an ounce; of water, two quarts. Boil the water firſt with the barley, then add the raiſins, and afterwards, toward the latter end of the decoction, the figs and liquorice; the decoction is fully ended when one quart only of liquor is left after ſtraining.

PECTORALIS, in anatomy, a pair of muſcles which poſſeſſes almoſt all the whole breaſt, and ſerves to move the arm forwards. This muſcle has its origin in the clavicle, the ſternum, and all the true ribs, and its termination at four fingers breadth below the head of the humerus. Its action is probably much aſſiſted by the action of the coraco-brachialis, and that of the deltoides by that of the upper part of this pectoral muſcle, which is uſually a kind of diſtinct muſcle. Naturaliſts obſerve a ſingular mark of providence, in the ſize and ſtrength of the pectoral muſcle in different animals. It is by the action of this muſcle, that the flying of birds is chiefly performed; and therefore much larger and ſtronger in birds, than in any animals not made for flight.

PECTORIS OS, in anatomy. See the article STERNUM.

PECU-

PECULATE, in civil law, the crime of imbezzling the public money, by a perſon intruſted with the receipt, management, or cuſtody thereof.

This term is alſo uſed by civilians for a theft, whether the thing be public, fiſcal, ſacred, or religious.

PECULIAR, in the canon law, ſignifies a particular pariſh or church that has juriſdiction within itſelf for granting probates of wills, and adminiſtrations, exempt from the ordinary or biſhop's courts. The king's chapel is a royal peculiar, exempt from all ſpiritual juriſdiction, and reſerved to the viſitation and immediate government of the king himſelf. There is likewiſe the archbiſhop's peculiar; for it is an antient privilege of the ſee of Canterbury, that wherever any manors or advowſons belong to it, they forthwith become exempt from the ordinary, and are reputed peculiars: there are fifty-ſeven ſuch peculiars in the ſee of Canterbury.

Beſides theſe, there are ſome peculiars belonging to deans, chapters, and prebendaries, which are only exempted from the juriſdiction of the archdeacon: theſe are derived from the biſhop, who may viſit them, and to whom there lies an appeal.

Court of PECULIARS, is a court in which the affairs belonging to peculiars are tranſacted.

PECULIUM, the ſtock or eſtate which a perſon, in the power of another, as a ſlave, may acquire by his induſtry.

In the romiſh church, peculium denotes the goods which each religious reſerves and poſſeſſes to himſelf.

PECUNIA, MONEY. See MONEY.

In our old law books pecunia denotes an eſtate in goods and chattels, as well as in money.

PECUNIARY, a term applied to the puniſhment of offenders by mulct or fine.

PEDAGOGUE, or PÆDAGOGUE, παιδαγωγός, a tutor or maſter, to whom is committed the diſcipline, and direction of a ſcholar, to be inſtructed in grammar and other arts.

PEDALS, the largeſt pipes of an organ, ſo called becauſe played and ſtopped with the foot. The pedals are made ſquare, and of wood; they are uſually thirteen in number. They are of modern invention, and ſerve to carry the ſounds an octave deeper than the reſt. See ORGAN.

PEDANEUS, in the civil law, a petty judge who has no formal ſeat of juſtice, but hears cauſes ſtanding, and without any tribunal. The pedanei were eſtabliſhed in the ſee of every province, by the emperor Zeno: and Juſtinian erected ſeven of them at Conſtantinople, in manner of an office, granting them power to judge in any ſum as high as three hundred crowns.

PEDANT, is uſed for a rough unpoliſhed man of letters, who makes an impertinent uſe of the ſciences, and abounds in unſeaſonable criticiſms and obſervations. Dacier defines a pedant, a perſon who has more reading than good ſenſe; and Malebranche deſcribes him, as a man full of falſe erudition, who makes a parade of his knowledge, and is ever quoting ſome greek or latin author, or hunting back to a remote etymology: hence,

PEDANTRY, the quality or manner of a pedant.

PEDARIAN, in roman antiquity, thoſe ſenators who ſignified their votes by their feet, not their tongues; that is, ſuch as walked over to the ſide of thoſe whoſe opinion they approved of, in diviſions of the houſe. See the article SENATE.

PEDENA, or PENDENA, a town of Iſtria in the territory of Venice, ſituated twenty-eight miles ſouth-eaſt of Cabo de Iſtria.

PEDESTAL, in architecture, the loweſt part of an order of columns, being that which ſuſtains the column, and ſerves it as a foot or ſtand. See COLUMN.

The pedeſtal conſiſts of three principal parts, *viz.* a ſquare, trunk, or dye, which makes the body; a corniche, the head; and a baſe, the foot of the pedeſtal. The pedeſtal is properly an appendage to a column, not an eſſential part of it; though M. Le Clerc thinks it eſſential to a complete order.

There are as many kinds of pedeſtals as there are of orders of columns, *viz.* the tuſcan, doric, ionic, corinthian, and compoſite: ſome ſay that the height of the pedeſtal in each order, ought to be a third part of the whole column, comprehending the baſe and capital, and their proper adjuncts, as architrave, frieze, and corniche, a fourth part of the ſame pillar. Indeed Vignola, and moſt of the moderns, make the pedeſtal and all its ornaments in all the orders one third of the height of the column, including the baſe and capital; but ſome deviate from this rule. See the article BASE, &c.

The whole height of the tuſcan column, comprehending the architrave, frieze and corniche, being divided into nine parts, two of theſe, according to Vitruvius, go to the height of the pedeſtal; which is by him deſcribed in two different forms, one of which is plain, having only a plinth for the baſe, and another for the capital: the height of each of theſe plinths is one-ſixth of the whole height of the pedeſtal, and the projecture of theſe plinths is one-ſixth of their height. In the pedeſtal that he deſcribes of the other form, he alſo divides the whole height of the pedeſtal into ſix parts, one of which goes to the baſe, and one to the capital. Palladio and Scamozzi make the tuſcan pedeſtal three modules high, Vignola five. See TUSCAN.

For the proportions of the doric pedeſtal, ſee the article DORIC.

And for the proportions of the ionic pedeſtal, ſee the article IONIC.

The corinthian pedeſtal is the richeſt and moſt delicate of all. The proportions of this pedeſtal are alſo given already under the article CORINTHIAN ORDER.

Vitruvius divides the whole height of the compoſite column into thirteen parts, making the height of the pedeſtal three of thoſe parts. Vignola makes the compoſite pedeſtal of the ſame height with the corinthian, *viz.* ſeven modules; Scamozzi, ſix modules two minutes; Palladio, ſix modules ſeven minutes; in the goldſmith's arch, ſeven modules eight minutes. Its members in Vignola are the ſame with thoſe of the corinthian, but with this difference, that whereas theſe are moſt of them enriched with carvings in the corinthian, they are all plain in the compoſite, and there is alſo a difference in the profiles of the baſe and corniche in the two orders. Daviler obſerves, that the generality of architects uſe tables or pannels, either in relievo or creux in the dyes of pedeſtals, without any regard to the character of the order: thoſe in relievo he obſerves are only ſuitable to the tuſcan and doric; the three others muſt be indented, which he ſays is a thing the antients never practiſed, as being contrary to the rules of ſolidity and ſtrength.

Pedeſtals acquire other denominations, as thoſe following: 1. Square pedeſtal, is that whoſe height and width are equal, as that of the arch of the lions at Verona, of the corinthian order; and ſuch ſome followers of Vitruvius, as Serlio, Philander, &c. have given to their tuſcan orders. 2. Double pedeſtal, is that which ſupports two columns, and has more breadth than height. 3. Continued pedeſtal, is one which ſupports a row of columns without any break or interruption, as thoſe which ſuſtain the fluted columns of the palace of the Tuilleries, on the garden-ſide.

PEDESTALS *of ſtatues*, are ſuch as ſerve to ſupport ſtatues or figures. Vignola obſerves, that there is no part of architecture more arbitrary, and in which more liberty may be taken, than in the pedeſtals of ſtatues; there being no rules or laws preſcribed by antiquity, nor any ſettled even by the moderns. There being then no ſettled proportion for theſe pedeſtals, the height depends on the ſituation, and the figure that they ſuſtain: when on the ground, the pedeſtal is uſually two thirds or two fifths of that of the ſtatue; the more maſſive the ſtatue is the ſtronger the pedeſtal muſt be. Their form and character, &c. are to be extraordinary and ingenious, far from the regularity and ſimplicity of the pedeſtals of columns. The ſame author gives a multiplicity of forms, as oval, triangular, multangular, &c.

PEDIÆUS, in anatomy, the ſecond of the extenſor muſcles of the foot, having its origin in the lower part of the perone and annular ligament; and being divided into four tendons, which are inſerted into the external part of the firſt articulation of the four toes. Its uſe is to extend the foot, together with the firſt of the extenſors, called the extenſor communis.

PEDICLE, among botaniſts, that part of a ſtalk which immediately ſuſtains the leaf of a flower or a fruit, and is commonly called a foot-ſtalk.

PEDICULARIS, RED RATTLE, or LOUSE-WORT, in botany, a genus of the didynamia-angioſpermia claſs of plants, the corolla whereof conſiſts of a ſingle ringent petal; the tube is oblong and gibbous; the upper lip galeated, erect, compreſſed, and emarginated; the under one is patent, plane, ſemitrifid, and obtuſe; the fruit is a roundiſh, acuminated capſule; the ſeeds are numerous, roundiſh, compreſſed and covered. This plant is of a cooling and drying nature, whence it is recommended in fiſtulas and other ſinous ulcers. It

alſo

alſo ſtops hæmorrhages and the menſes.

PEDICULARIS MORBUS, the ſame with phthiriaſis. See PHTHIRIASIS.

PEDICULUS, LOUSE, in zoology, a genus of inſects, the body of which is lobated at the ſides; the legs are ſix, ſerving only for walking; and the eyes are two, and are ſimple.

Moſt animals are infeſted with lice, or inſects which feed upon them: thus ſheep have one ſpecies, oxen another, &c. and mankind are not free from them; for beſides the common kind, whoſe natural habitation is in the heads of children, there is another kind called the crab-louſe, whoſe natural reſidence is about the pubes. Authors alſo reckon the death-watch among the number of lice.

PEDILUVIUM, a bathing of the feet.

This bath may be prepared of the ſame ingredients with other baths. It may either conſiſt of light, pure water alone; or, to correct the qualities of heavy and hard water, a lixivium or bran of wheat or chamomile-flowers may be added.

Pediluvium is highly expedient for the purpoſes of derivation in thoſe diſeaſes which ariſe from the congeſtions of the humours to the head and breaſt, produced by ſpaſms of the inferior parts, and eſpecially of the hypochondria. Among this kind, beſides lethargic diſeaſes, we may reckon almoſt all diſorders of the head, ſuch as madneſs, melancholy, cephalæas, hemicranias, the clavus hyſtericus, vertigo's, toothachs, pains of the ears, a gutta roſacea; inflammations and defluxions of ſaline humours on the eyes, immoderate hæmorrhages from the noſe, and long watchings. Of this kind are alſo ſome diſorders which affect the breaſt, ſuch as convulſive aſthmas, dyſpnœas ariſing from a plethora, palpitations of the heart, dry coughs, and ſpittings of blood. Beſides, baths for the feet in conſequence of their ſingular efficacy in relaxing ſpaſms, are highly beneficial in ſpaſmodic and convulſive diſorders, in pains, cardialgias, colics, eſpecially of the hæmorrhoidal kind, gripes produced by the ſtone, and inflations of the ſtomach.

It is to be obſerved, that pediluvium produces more happy effects, if before it is uſed the quantity of blood is leſſened by veneſection in the feet: it ſhould be uſed about bed-time; and the feet kept warm till the patient goes to bed, by which means perſpiration all over the body is increaſed.

PEDIGREE. See the article DESCENT.

PEDIMENT, in architecture, is a kind of low pinnacle, ſerving to crown an ordonnance, or finiſh a frontiſpiece, and is placed as an ornament over gates, doors, windows, niches, altars, &c. being ordinarily of a triangular form, but ſometimes forming an arch of a circle. The parts of a pediment are the tympanum and the corniche, which crowns it, and the entablature, which ſerves it as a baſe, or ſcale. Architects have taken a great deal of liberty in the form of this member; nor do they vary leſs as to the proportion of the pediment. The moſt beautiful, according to Daviler, is that where its height is about one fifth of the length of its baſe.

The pediment is uſually triangular, and ſometimes an equilateral triangle, called alſo a pointed pediment; it is ſometimes circular, though M. Felibien obſerves, that we have no inſtance of round pediments in the antique, beſides thoſe in the chapels of the rotundo. Sometimes its upper corniche is divided into three or four ſides, or right lines: ſometimes the corniche is cut or open a-top, which is an abuſe introduced by the moderns, particularly Michael Angelo; for the deſign of this part over doors, windows, &c. being chiefly to ſhelter thoſe underneath from the rain, to leave it open in the middle is to fruſtrate its end. Sometimes the pediment is formed of a couple of ſcrolls or wreaths like two conſoles joined together; ſometimes again it is without a baſe, or its lower corniche is cut out, all but what is beſtowed on two columns or pilaſters, and on theſe is raiſed an arch or ſweep, inſtead of an entablature, of which Serlio gives an inſtance in the antique in a corinthian gate at Foligny, in Umbria; and Daviler a modern one in the church of St. Peter at Rome.

Under this kind of pediments come thoſe little arched corniches, which form pediments over doors and windows, ſupported by two conſoles, inſtead either of entablature or columns.

Sometimes the pediment is made double, *i. e.* a leſs pediment is made in the tympanum of a larger, on account of ſome projecture in the middle, as the frontiſpiece of the church of the great Jeſus at Rome; but this is accounted an abuſe in architecture, though authoriſed by very good buildings, as the large pavilion of the louvre, where the caryatides

atides ſupport three pediments, one in another: ſometimes the tympanum of the pediment is cut out, or left open to let in light, as is ſeen under the portico of the capitol at Rome; laſtly, this open pediment is ſometimes triangular, and enriched with ſculpture, as roſes, leaves, &c. as is found in moſt of the gothic churches.

M. Le Clerc obſerves, that the modillions in the corniche of the pediment ſhould always anſwer exactly over thoſe of the entablature. Indeed Vitruvius ſays, that the antients did not allow of any modillions at all in pediments. M. Le Clerc alſo obſerves, that the corniche which ſerves the pediment as a baſe, ſhould have no cymatium, by reaſon the cymatium of the reſt of the entablature, when it meets the pediment, paſſes over it. This change of determination occaſions a conſiderable difficulty; the cymatium in this caſe appearing too broad in the turn of the angle, to remedy which, architects have recourſe to ſeveral expedients. A pointed pediment may crown three arches, but a circular pediment can only crown agreeably. There ſhould never be uſed more than two tympana over each other in the ſame frontiſpiece, and even where there are two, it would be proper to have the lower circular, and the upper pointed.

PEDIR, a town in the iſland of Sumatra, in the Eaſt-Indies, ſituated in eaſt long. 94° lat. 5°.

PEDOMETER, or PODOMETER, the ſame with perambulator. See the article PERAMBULATOR.

PEDRERO, PETERERO, or PATERERO, a ſmall piece of ordnance, uſed on board ſhips, for the diſcharging of nails, broken iron, or partridge ſhot, on an enemy attempting to board. See ORDNANCE. They are generally open at the breech, and their chamber made to take out, to be loaded that way, inſtead of at the muzzle.

PEDUNCLE, among botaniſts, the ſame with pedicle. See the article PEDICLE.

PEDUNCULI CEREBELLI, in anatomy, three medullary proceſſes of the cerebellum, whereby that part is joined to the medulla oblongata. See the article CEREBELLUM.

The firſt of theſe proceſſes aſcends from the cerebellum towards the teſtes, and forms what is called the valvula magna of the brain; the ſecond forms the annular prominence of Willis; and the third deſcends to the ſpinal marrow.

PEE, in mining, is uſed for the place where two veins meet and croſs one another.

PEEBLES, or PEBLIS, a town of Scotland, capital of the ſhire of Tweedale, ſituated on the river Tweed, twenty-two miles ſouth of Edinburgh.

PEEK, in the ſea-language, is a word uſed in various ſenſes. Thus the anchor is ſaid to be a-peek, when the ſhip being about to weigh comes over her anchor in ſuch a manner that the cable hangs perpendicularly betwixt the hauſe and the anchor. To heave a-peek is to bring the peek ſo as that the anchor may hang a-peek. A ſhip is ſaid to ride a-peek, when lying with her main and fore-yards hoiſted up, one end of her yards is brought down to the ſhrouds, and the other raiſed up an end; which is chiefly done when ſhe lies in rivers, leſt other ſhips falling foul of the yards ſhould break them. Riding a-broad peek, denotes much the ſame, excepting that the yards are only raiſed to half the height.

Peek is alſo uſed for a room in the hold, extending from the bitts forward to the ſtem: in this room men of war keep their powder, and merchant-men their victuals.

PEER, in general, ſignifies an equal, or one of the ſame rank and ſtation: hence in the acts of ſome councils we find, theſe words, with the conſent of our peers, biſhops, abbots, &c. Afterwards the ſame term was applied to the vaſſals or tenants of the ſame lord, who were called peers, becauſe they were all equal in condition, and obliged to ſerve and attend him in his courts; and peers in fiefs, becauſe they all held fiefs of the ſame lord. The term peers is now applied to thoſe who are impannelled in an inqueſt upon a perſon for convicting or acquitting him of any offence laid to his charge; and the reaſon why the jury is ſo called, is, becauſe by the common law, and the cuſtom of this kingdom, every perſon is to be tried by his peers or equals, a lord by the lords, and a commoner by commoners. See the article JURY.

PEER *of the realm*, a noble lord who has a ſeat and vote in the houſe of lords, which is alſo called the houſe of peers. Theſe lords are called peers, becauſe, though there is a diſtinction of degrees in our nobility, yet in public actions they

are

are equal, as in their votes in parliament, and in trying any nobleman, or other perſon impeached by the commons, *&c.* See the article PARLIAMENT.

All the peers who have a right to ſit and vote in parliament, are to be ſummoned at leaſt twenty days before the trial of a peer, indicted for treaſon or felony: the method of proceeding in which, is, after the indictment is found, the king, by commiſſion under the great ſeal, appoints one of the peers, and generally the lord chancellor, to be lord high ſteward, who in theſe caſes ſits as judge. In order to bring the indictment before him, a certiorari is iſſued out of the court of chancery; and another writ alſo iſſues for bringing up the priſoner, a precept being made for that purpoſe by the lord high ſteward, aſſigning a day, and the place of trial, and for ſummoning the peers, twelve of whom are at leaſt to be preſent, and as many more as chooſe to be preſent. The day of trial being come, and the lord high ſteward being ſeated in his uſual ſtate, after the commiſſion is read, and the particular ceremonies are over, his lordſhip declares to the priſoner at the bar, the cauſe of their aſſembly, aſſures him of juſtice, and at the ſame time encourages him to anſwer without fear; on which the indictment is read over, and the priſoner arraigned; when after hearing all the evidence produced for the king, and the priſoner's anſwer, the priſoner is ordered to withdraw from the bar, when the lords go to ſome place by themſelves to conſider of the evidence; and afterwards being returned, in order to give their verdict, the lord high ſteward openly demands of the lords one by one, beginning with the puiſne lord, whether the priſoner, calling him by his name, be guilty of the crime for which he is arraigned; when laying their right hand on their left breaſt, they ſeparately anſwer either guilty or not guilty, upon their honour; and if he be found guilty by a majority of votes more than twelve, he is brought to the bar again, when the lord high ſteward acquaints the priſoner with the verdict of his peers, and paſſes ſentence and judgment accordingly. It has been adjudged, that where ſuch trial is by commiſſion, as above, the lord high ſteward, after a verdict given, may take time to adviſe upon it, and his office continues till he paſſes judgment.

A peer is not to be put upon any inqueſt, even though the cauſe has a relation to two peers: but in trials, where any peer is either plaintiff or defendant, there muſt be two or more knights returned on the jury. Where a peer is defendant in a court of equity, he is not to be ſworn to his anſwer, but it may be upon his honour, as in the trial of peers: however when a peer is to anſwer to interrogatories, or to make an affidavit, or is to be examined as a witneſs, he is to be ſworn. For the other privileges of the peers, ſee the articles NOBILITY, PARLIAMENT, *&c.*

PEERS *of France*, are twelve great lords of that kingdom, of which ſix are dukes, and ſix counts; and of theſe, ſix are eccleſiaſtics, and ſix laymen: thus, the archbiſhop of Rheims, and the biſhop of Laon and Langres are dukes and peers, and the biſhops of Chalon on the Marn, Noyons, and Beauvais, are counts and peers. The dukes of Burgundy, Normandy, and Aquitain, are lay peers and dukes; and the counts of Flanders, Champaign, and Toulouſe, lay peers and counts. Theſe peers ſtill aſſiſt at the coronation of kings, either in perſon or by their repreſentatives, where each performs the functions attached to his reſpective dignity: but as the ſix lay peerages are all at preſent united to the crown except that of the count of Flanders; ſix lords of the firſt quality are choſen to repreſent them: but the eccleſiaſtical peers uſually aſſiſt in perſon. At preſent, the title of peer is beſtowed on every lord whoſe eſtate is erected into a peerage, the number of which is uncertain, as it depends entirely on the king.

PEER, in building. See the article PIER.

PEERESS, a woman who is noble by deſcent, creation, or marriage.

If a peereſs, by deſcent or creation, marries a perſon under the degree of nobility, ſhe ſtill continues noble: but if ſhe obtains that dignity only by marriage, ſhe loſes it, on her afterwards marrying a commoner; yet, by the curteſy of England, ſhe always retains the title of her nobility. No peereſs can be arreſted for debt or treſpaſs; for though, on account of their ſex, peereſſes cannot ſit in the houſe of lords, yet they enjoy the privileges of peers, and therefore all peereſſes by birth, are to be tried by their peers.

PEEVIT,

PEEVIT, or BLACK-CAP, in ornithology, the grey larus, with a black head. See the article LARUS.

This is a very elegant ſpecies: its ſize is about that of the common tame pigeon; the head is ſmall; and the eyes bright, their iris is of a pale, hazel colour; the verges of the eye-lids are red, and they are ſurrounded with a fine, white plumage; the beak is nearly an inch in length, it is of a fine, bright ſcarlet, and is a little bent downwards; the legs are ſlender; their colour is a blood-red; the claws are black, and the toe behind is very ſhort and ſmall.

PEGANUM, WILD RUE, or HARMEL, in botany, a genus of the polyandria-monogynia claſs of plants, the flower of which conſiſts of five oval petals; and its fruit is a trilocular capſule containing a great many ſmall ſeeds.

This herb is ſaid to have an inebriating and ſoporific quality.

PEGASUS, in aſtronomy, a conſtellation of the northern hemiſphere, in form of a flying horſe, ſaid by different authors to contain 19, 20, and 93 ſtars.

PEGMATES, in antiquity, a kind of gladiators, who fought on ſcaffolds erected on purpoſe. See GLADIATORS.

PEGNITS, a river of Franconia, in Germany, which joins its waters with the Regnits a little below Nurenburg.

PEGU, the capital of the kingdom of Pegu, and ſituated upon a river of the ſame name, in 97° eaſt long. and north lat. 17° 30′.

The kingdom of Pegu is extended along the eaſt ſide of the bay of Bengal.

PEINE, a town of lower Saxony, fourteen miles weſt of Brunſwick.

PEKIN, the metropolis of the empire of China, is ſituated in eaſt long. 111°, and north lat. 40°.

It is about twenty miles in circumference, and is ſaid to contain 2,000,000 of people.

PELAGIÆ CONCHÆ, in natural hiſtory, ſuch ſhell-fiſh as always reſide in the deep parts of the ſea, or thoſe remote from land.

PELAGIANS, a chriſtian ſect who appeared about the latter end of the fourth, or the beginning of the fifth century.

Pelagius, the author of this ſect, was born in Wales, and his name was Morgan, which in the welſh language ſignifies ſea-born; from whence he had his latin name Pelagius. Some of our antient hiſtorians pretend that he was abbot of Bangor: but this is impoſſible, becauſe the britiſh monaſteries were of a later date. St. Auſtin gives him the character of a very pious man, and a chriſtian of no vulgar rank: according to the ſame father, he travelled to Rome, where he aſſociated himſelf with perſons of the greateſt learning and figure, and wrote his commentaries on St. Paul's Epiſtles, and his letters to Melania and Demetrias; but being charged with hereſy, he left Rome, and went into Africa, and from thence to Jeruſalem, where he ſettled. He died ſomewhere in the eaſt, but where is uncertain. He was charged with maintaining the following doctrines: 1. That Adam was by nature mortal, and whether he had ſinned or not, would certainly have died. 2. That the conſequences of Adam's ſin were confined to his own perſon. 3. That new-born infants are in the ſame condition with Adam before the fall. 4. That the law qualified men for the kingdom of heaven, and was founded upon equal promiſes with the goſpel. 5. That the general reſurrection of the dead does not follow in virtue of our Saviour's reſurrection. 6. That the grace of God is given according to our merits. 7. That this grace is not granted for the performance of every moral act; the liberty of the will, and information in points of duty being ſufficient, &c. Pelagius's ſentiments were condemned by ſeveral councils in Africa, and by a ſynod at Antioch.

There was alſo a ſect of ſemi-pelagians; who, with the orthodox, allowed of original ſin; but denied that the liberty of the will could be ſo far impaired thereby, that men could not of themſelves do ſomething, which might induce God to afford his grace to one more than another: and as to election, they held, that it depended on our perſeverance; God chooſing only ſuch to eternal life, as continued ſtedfaſt in the faith.

PELECANUS, in ornithology, a name ſometimes given to the platea, or ſpoon-bill, as well as to the pelican, properly ſo called. See PLATEA and PELICAN.

PELECOIDES, in geometry, a figure in form of an hatchet: ſuch is the figure B C D A, plate CXCV. fig. 3. contained under the two inverted quadrantal arcs A B and A D, and the ſemi-circle B C D. The area of the pelecoides is demonſtrated to be equal to the ſquare A C, and that again to the parallelogram E B.

It

It is equal to the ſquare A C, becauſe it wants of the ſquare on the left hand the two ſegments A B and A C, which are equal to the two ſegments B C and C D, by which it exceeds on the right hand.

PELICAN, *pelicanus*, in ornithology, a genus of birds, of the order of the anſeres, the beak of which is very long, crooked, and unguiculated at the extremity: its ſides are not denticulated, and the anterior part of the head towards the throat is naked. See ORNITHOLOGY.

To this genus belong the pelican, properly ſo called, with a bag at the throat, the cormorant, and ſhag. See the articles CORMORANT and SHAG.

Mr. Edwards deſcribes a pelican brought from the Cape of Good-Hope, which ſeemed to him to be more than double the ſize of the largeſt ſwan. He tells us, he ſaw its keeper put his head into the bag, or pouch, under the bill, and that another man's head might have been put in with it.

PELICAN, in chemiſtry, a kind of double glaſs-veſſel, uſed in diſtilling liquors by circulation: it conſiſts of a cucurbit and alembic-head, with two tubes bending into the cucurbit again. See plate CXCVI. fig. 1. n° 1.

But as ſuch veſſels are not eaſily procurable, a ſimple ſort, conſiſting only of a bolt-head with a long neck, into which the neck of another glaſs-veſſel is inverted, and the juncture well luted, as it muſt alſo be in the former, may be ſeen *ib.* n° 2.

The term pelican is alſo given to an inſtrument, uſed by ſurgeons for drawing teeth; and likewiſe for an antient piece of ordnance, carrying a ball of ſix pounds.

PELISA, a town of lower Hungary, ſubject to the houſe of Auſtria, thirteen miles weſt of Buda.

PELLETS, in heraldry, thoſe roundles that are black, called alſo ogreſſes and gunſtones, and by the French torteaux de ſable.

PELLICLE, among phyſicians, *&c.* denotes a thin film, or fragment of a membrane.

When any liquor is evaporated in a gentle heat, till a pellicle ariſe at top, it is called an evaporation to a pellicle; wherein there is juſt liquor enough left, to keep the ſalts in fuſion.

PELOSO, a town in the kingdom of Naples, thirty-five miles weſt of Barri.

PELLS, or *clerk of the* PELLS. See the article CLERK.

PELLUCID, the ſame with diaphanous, or tranſparent. See DIAPHANOUS.

PELTA, πελτη, in antiquity, a ſmall light ſort of buckler. See BUCKLER.

PELVIS, in anatomy, the lower part of the cavity of the abdomen, thus called from its reſemblance to a baſon, or ewer, in latin called pelvis. It is formed by the oſſa ilia and iſchia, the os ſacrum, the os coccygis, and the oſſa pubis. See the article INNOMINATA OSSA.

The pelvis is much larger in women than in men, to give room for the growth, *&c.* of the fœtus.

PELVIS *of the kidneys*, is a membranaceous cavity in the kidneys, which ſends out ſeveral proceſſes called the tubuli of the pelvis, and ſurrounds the renal papillæ. See KIDNEYS and URETERS.

PELUSIUM, a city of Egypt, now called Damietta. See DAMIETTA.

PEMBRIDGE, a market-town of Herefordſhire, thirteen miles north-weſt of Hereford.

PEMBROKE, the capital of Pembrokeſhire, in ſouth Wales: weſt long. 5°, north lat. 51° 45'. This town ſends two members to parliament.

PEN, a little inſtrument uſually formed of a quill; ſerving to write withal.

Pens are alſo ſometimes made of ſilver, braſs, or iron.

Dutch PENS, are made of quills that have paſſed through hot aſhes, to take off the groſſer fat and moiſture, and render them more tranſparent.

Fountain-PEN, is a pen made of ſilver, braſs, *&c.* contrived to contain a conſiderable quantity of ink, and let it flow out by gentle degrees, ſo as to ſupply the writer a long time without being under the neceſſity of taking freſh ink.

The fountain-pen is compoſed of ſeveral pieces, as in plate CXCVI. fig. 2. where the middle piece F carries the pen, which is ſcrewed into the inſide of a little pipe, which again is ſoldered to another pipe of the ſame bigneſs as the lid G; in which lid is ſoldered a male ſcrew, for ſcrewing on the cover, as alſo for ſtopping a little hole at the place, and hindering the ink from paſſing through it. At the other end of the piece F is a little pipe, on the outſide of which the top-cover H may be ſcrewed. In the cover there goes a port craion, which is to be ſcrewed into the laſt-mentioned pipe, in order to ſtop the end of the pipe, into which the ink is to be poured by a fun-

nel. To uſe the pen, the cover G muſt be taken off, and the pen a little ſhaken, to make the ink run more freely.

PEN, or PENSTOCK. See PENSTOCK.

PENANCE, a puniſhment, either voluntary or impoſed by authority, for the faults a perſon has committed. Penance is one of the ſeven ſacraments of the romiſh church. Beſides faſting, alms, abſtinence, and the like, which are the general conditions of penance; there are others of a more particular kind, as the repeating a certain number of ave-marys, pater-noſters, and credos, wearing a hair-ſhirt, and giving one's ſelf a certain number of ſtripes. In Italy and Spain it is uſual to ſee chriſtians almoſt naked, loaded with chains and a croſs, and laſhing themſelves at every ſtep.

The manner of public penance in the romiſh church is as follows: the penitent comes into the church in a very plain and modeſt garb; if he be under excommunication, he kneels without the church-door; but if not, within the door. The congregation being aſſembled, the penitentiary prieſt ſits in a chair in the middle of the nave of the church; and the penitent kneels before him, begging with a loud voice that his ſins may be forgiven him: the prieſt anſwers with a ſhort remonſtrance, and enjoins him ſuch penance as he thinks proper. He then takes the penitent by the right hand, and leads him to the church-door, where he ſays; you are turned out of the church for the ſins you have committed, in like manner as Adam, for his diſobedience, was driven from Paradiſe; and then the church-door is ſhut againſt him. When the penitent has completed the penance enjoined him, he returns back to the penitentiary, with a certificate thereof ſigned by the miniſter of his pariſh, and on the day of abſolution, preſents himſelf upon his knees at the church-door, with an unlighted taper in his hand. Prayers being ended, the prieſt goes to the church-door, and makes a pretty long exhortation to the penitent; which being done, he takes him by the hand, and leads him into the church. If the penitent be under excommunication, he muſt kneel before the prieſt, who ſtrikes him ſeveral times on the ſhoulders with a whip made of cords.

Penance, in our canon-law, is an eccleſiaſtical puniſhment chiefly adjudged to the ſin of fornication. The puniſhment is thus deſcribed by the canons: the delinquent is to ſtand in the church-porch on ſome Sunday bare-headed and bare-foot, in a white ſheet, with a white wand in his hand, bewailing himſelf, and begging every one to pray for him; then he is to enter the church, and falling down, is to kiſs the ground; and at laſt is to be placed on an eminence in the middle of the church, over-againſt the miniſter, who is to declare the foulneſs of his crime, which is odious to God, and ſcandalous to the congregation. If the crime be not notorious, the canons allow the puniſhment to be commuted at the parties requeſt for a pecuniary mulct, for the benefit of the poor, *&c.*

PENÆA, in botany, a plant of the tetrandria-monogynia claſs, with a monopetalous campaniform flower; and a quadragonal capſule for its fruit, containing four cells, with two oblong ſeeds in each.

This plant has been erroneouſly ſuppoſed to have produced the ſarcocolla of the ſhops. See SARCOCOLLA.

PENATES, in roman antiquity, a kind of tutelar deities, either of countries or particular houſes; in which laſt ſenſe, they differed in nothing from the lares. See the article LARES.

The penates were properly the tutelar gods of the Trojans, and were only adopted by the Romans, who gave them the title of penates.

PENCE, or *Peter*-PENCE. See PETER.

PENCIL, an inſtrument uſed by painters for laying on their colours. Pencils are of various kinds, and made of various materials; the larger ſorts are made of boars briſtles, the thick ends of which are bound to a ſtick, bigger or leſs according to the uſes they are deſigned for: theſe, when large, are called bruſhes.

The finer ſorts of pencils are made of camels, badgers, and ſquirrels-hair, and of the down of ſwans; theſe are tied at the upper end with a piece of ſtrong thread, and incloſed in the barrel of a quill.

All good pencils on being drawn between the lips come to a fine point.

PENCIL is alſo an inſtrument uſed in drawing, writing, *&c.* made of long pieces of black-lead, or red-chalk, placed in a groove cut in a ſlip of cedar, on which other pieces of cedar being glued, the whole is planed round, and one of the ends being cut to a point, it is fit for uſe.

Theſe

BRITISH MUSEUM

Fig. 1. PELICAN.

N°. 1.

N°. 2.

Fig. 2. FOUNTAIN-PEN.

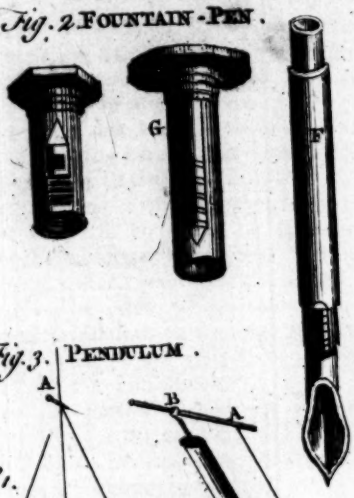
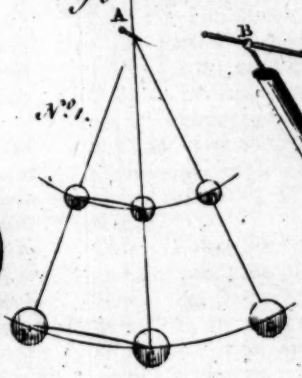
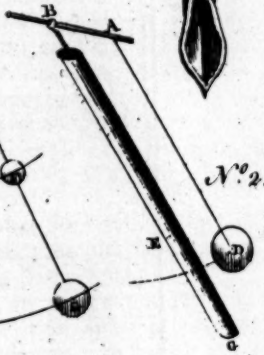


Fig. 3. PENDULUM.

N°. 1.



N°. 2.



N°. 3.

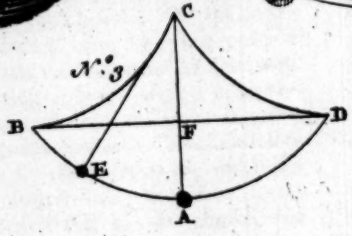


Fig. 4. PENTAGON.

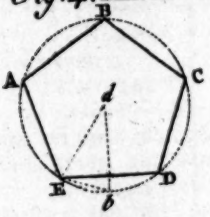


Fig. 5. PENTAGRAPH.

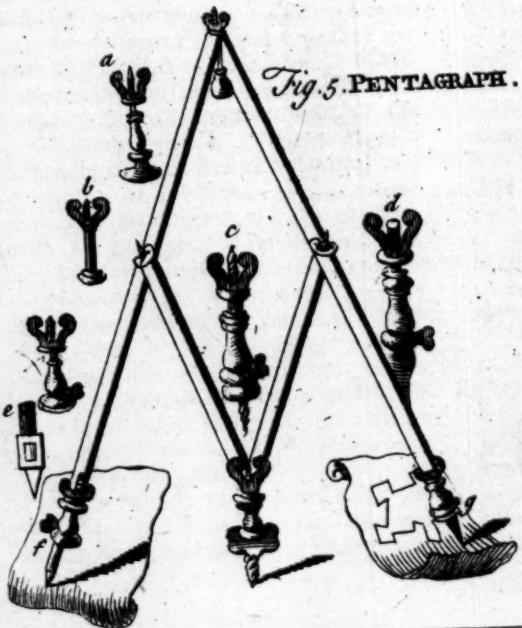
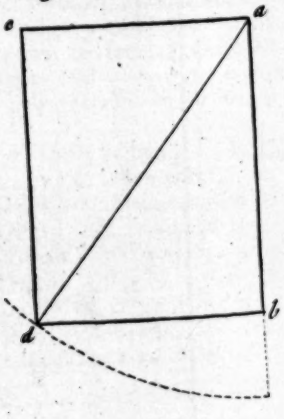


Fig. 6. PERCUSSION.



J. Jeffreys sculp.

These pencils, on their importation, pay a duty of 2s. $4\frac{72\frac{1}{2}}{100}$d. the groſs, and draw back, on exportation, 2s. $1\frac{87\frac{1}{2}}{100}$d.

PENDANT, an ornament hanging at the ear, frequently conſiſting of diamonds, pearls, and other precious ſtones.

The pendants of the european ladies are extremely ſmall, when compared with thoſe worn both by men and women in the Eaſt-Indies; among whom it is the faſhion to lengthen out the ears, and to enlarge the hole made in them, by putting in pendants ſet with ſtones of the ſize of ſaucers. Pyrard informs us, that the queen of Calicut, and other ladies of her court, have their ears by this means weighed down to their breaſts, and that the holes in them were large enough to paſs the hand through. This they imagine a great beauty, and therefore the common people are not allowed to have their ears ſtretched above the length of three fingers. In the Weſt-Indies, the Mexicans and other nations, not only hang pendants at their ears; but bore holes in their lips and noſtrils, and hang pendants to them.

PENDANTS, in heraldry, parts hanging down from the label, to the number of three, four, five, or ſix at moſt, reſembling the drops in the doric frieze. When they are more than three, they muſt be ſpecified in blazoning.

PENDANTS, of a ſhip, are thoſe ſtreamers or long colours which are ſplit and divided into two parts ending in points, and hung at the head of maſts, or at the yard-arm ends.

PENDANT *feathers*, with falconers, are thoſe feathers that grow behind the thighs of an hawk.

PENDANTS, among floriſts, the ſame with apices, or antheræ. See the articles ANTHERÆ and STAMINA.

PENDENNIS, a caſtle in Cornwal, ſituated on Falmouth-bay, fifty miles ſouth-weſt of Launceſton.

PENDENTIVE, in architecture, the whole body of a vault ſuſpended out of the perpendicular of the walls, and bearing againſt the arch-boutants: or according to Daviler, it is the portion of a vault between the arches of a dome, uſually inriched with ſculpture.

The pendentives are generally of brick or ſoft ſtone; but care is to be taken, that the couches or beds of maſonry, be always laid level, and in right lines proceeding from the ſweep whence the riſe was taken: the joints too muſt be made as ſmall as poſſible, to ſave the neceſſity of filling them up with wood, or of uſing much mortar.

PENDULOUS, a term applied to any thing that bends or hangs downwards: thus, the flowers, whoſe ſlender ſtalks are not able to ſuſtain their heads upright, are called pendulous flowers. See the articles BOTANY and FLOWER.

PENDULUM, in mechanics, denotes any heavy body, ſo ſuſpended as that it may vibrate or ſwing, backwards and forwards, about ſome fixed point, by the force of gravity. See GRAVITY.

The vibrations of a pendulum are called its oſcillations. See OSCILLATION.

A pendulum, therefore, is any body, B, (plate CXCVI. fig. 3. n° 1.) ſuſpended upon, and moving about a fixed point, A, as a center.

The nature of a pendulum conſiſts in the following particulars: 1. The times of the vibrations of a pendulum, in very ſmall arches, are all equal. 2. The velocity of the bob, in the loweſt point, will be nearly as the length of the chord of the arch which it deſcribes in the deſcent. 3. The times of vibration in different pendulums, AB, AC, are as the ſquare roots of the times of their vibrations. 4. The time of one vibration is to the time of the deſcent, through half the length of the pendulum, as the circumference of a circle to its diameter. 5. Whence the length of a pendulum, vibrating ſeconds, will be found 39.2 inches nearly; and that of an half ſecond pendulum 9.8 inches. 6. An uniform homogeneous body BG (*ibid.* n° 2.) as a rod, ſtaff, *&c.* which is one third part longer than a pendulum AD, will vibrate in the ſame time with it.

From theſe properties of the pendulum we may diſcern its uſe as an univerſal chronometer, or regulator of time, as it is uſed in clocks, and ſuch like machines. By this inſtrument alſo we can meaſure the diſtance of a ſhip, by meaſuring the interval of time between the fire and the ſound of the gun; alſo the diſtance of a cloud, by numbering the ſeconds, or half-ſeconds, between the lightning and thunder. Thus, ſuppoſe between the lightning and thunder, we number 10 ſeconds; then, becauſe ſound paſſes through 1142 feet in one ſecond, we have the diſtance of the cloud equal to 11420 feet. Again, the height of any room,

or other object, may be measured by a pendulum vibrating from the top thereof. Thus, suppose a pendulum from the height of a room vibrates once in three seconds; then say, as 1 is to the square of 3. *viz.* 9, so is 39.2 to 352.8 feet, the height required. Lastly, by the pendulum we discover the different force of gravity on diverse parts of the earth's surface, and thence the true figure of the earth. See the article EARTH.

When pendulums were first applied to clocks, they were made very short; and, the arches of the circle being large, the time of vibration through different arches, could not in that case be equal; to effect which, the pendulum was contrived to vibrate in the arch of a cycloid, by making it play between two semicycloids C B, C D, (*ibid.* n° 3.) whereby it describes the cycloid B E A D; the property of which curve is, that a body vibrating in it, will describe all its arches, great or small, in equal times.

In all that has been hitherto said, the power of gravity has been supposed constantly the same. But, if the said power varies, the lengths of pendulums must vary in the same proportion, in order that they may vibrate in equal times; for we have shewn, that the ratio of the times of vibration and descent through half the lengths is given, and consequently the times of vibration and descent through the whole length is given: But the times of vibration are supposed equal, therefore the times of descent through the lengths of the pendulum are equal. But bodies descending through unequal spaces, in equal times, are impelled by powers that are as the spaces described, that is, the powers of gravity are as the lengths of the pendulums.

The greatest inconvenience attending this most useful instrument is, that it is constantly liable to an alteration of its length, from the effects of heat and cold, which very sensibly expand and contract all metalline bodies. See the article HEAT.

To remedy this inconvenience, the common method is by applying the bob of the pendulum with a screw; so that it may be at any time made longer or shorter, according as the bob is screwed downwards or upwards, and thereby the time of its vibrations kept always the same. Again, if a glass or metalline tube, uniform throughout, filled with quicksilver, and 58.8 inches long, were applied to a clock, it would vibrate seconds (for $39.2 = \frac{2}{3}$ of 58.8) and such a pendulum admits of a twofold expansion and contraction, *viz.* one of the metal and the other of the mercury, and these will be at the same time contrary, and therefore will correct each other. For by what we have shewn, the metal will extend in length with heat, and so the pendulum will vibrate slower on that account. The mercury also will expand with heat, and since by this expansion it must extend the length of the column upward, and consequently raise the center of oscillation; so that by this means its distance from the point of suspension will be shortened, and therefore the pendulum on this account will vibrate quicker: wherefore, if the circumstances of the tube and mercury are skilfully adjusted, the time of the clock might, by this means, for a long course of time, continue the same, without any sensible gain or loss.

This is the invention of the late ingenious Mr. Graham, in the year 1721, who made a clock of this sort, and compared it with one of the best of the common sort for three years together, and found the errors of the former but about $\frac{1}{3}$ part of the latter; of which the reader may see a farther account in Phil. Trans. n° 392. It is what is now called Mr. Graham's quicksilver-pendulum.

In the forty-seventh volume of the Philosophical Transactions, Mr. Short gives us an account of other inventions to remedy the same inconvenience. Mr. John Harrison, of Barrow, in Lincolnshire, famous for his invention of a clock to find the difference of longitude at sea, without having the least knowledge of what Mr. Graham had done before him, made several experiments upon wires of different metals, in order to find their different degrees of expansion and contraction. He thought that by a proper combination of wires of two different metals, differing considerably in their expansion and contraction, he might be enabled to keep the center of oscillation of a pendulum always at the same distance from the point of suspension. In consequence of these experiments, he made a pendulum consisting of one steel-wire, at the end of which is the bob or weight; and on each side of this wire, four wires alternately brass and steel, so disposed and contrived as to raise the pendulum by the same quantity that it is lengthened by heat, and to let down the

pendu-

pendulum in the ſame proportion as it is raiſed by cold.

Mr. Harriſon, in his firſt machine for meaſuring time at ſea, likewiſe applied this combination of wires of braſs and ſteel, to prevent any alterations by heat and cold. And in the other machines or clocks he has ſince made for the ſame purpoſe, a like method of guarding againſt the irregularities ariſing from this cauſe is uſed, as has been ſhown under the article LONGITUDE.

Mr. Graham alſo made a pendulum conſiſting of three bars, one of ſteel between two of braſs, and the ſteel bar acted upon a lever, ſo as to raiſe the pendulum, when lengthened by heat, and to let it down, when ſhortened by cold; but he found this clock liable to ſudden ſtarts and jerks in its motion.

The ingenious Mr. Ellicott, in the ſame volume of the Tranſactions, deſcribes a pendulum of his invention, compoſed of braſs and iron, with the method of applying it, ſo as to avoid the many jerks to which the machine might be liable.

But beſides the irregularities ariſing from heat and cold, pendulum-clocks are liable to others from friction and foulneſs; to obviate which, Mr. Harriſon has ſeveral excellent contrivances, whereby his clocks are almoſt entirely free from friction, and never need to be cleaned. See FRICTION and LONGITUDE.

PENE, a river of upper-Saxony, in Germany, which ſeparates the ſwediſh territories from thoſe of Brandenburg.

PENEMUNDER, a fortreſs of Germany, in the circle of upper-Saxony and dutchy of Pomerania, ſituated on the iſle of Uſedom, at the mouth of the river Pene, in eaſt long. 14° 10′, north lat. 54° 20′.

PENETRABILITY. See the article IMPENETRABILITY.

PENETRALE, in roman antiquity, properly denoted the chapel conſecrated to the penates, or houſhold-gods.

PENETRATION, *penetratio*, the act whereby one thing acts upon another, or takes up the place already poſſeſſed by another.

Chauvinus defines penetration the co-exiſtence of two or more bodies, ſo as one is preſent, or has its extenſion in the ſame place as the other.

Philoſophers hold the penetration of bodies abſurd, *i. e.* that two bodies ſhould be at the ſame time in the ſame place; and, accordingly, impenetrability is laid down as one of the eſſential properties of matter. What is commonly therefore meant by penetration, only amounts to the matter of one body being admitted into the vacuities of another.

PENFORD, a market-town of Somerſetſhire, ſituated ten miles weſt of Bath.

PENGUIN ISLAND and BAY, are ſituated on the coaſt of Patagonia in ſouth-America: weſt long. 70°, ſouth lat. 47°.

PENGUIN, in ornithology, a name given to a ſpecies of the alca, with eight furrows on the beak, and a white ſpot before the eye. It is a very large and ſingular bird, equal to the common gooſe in ſize; the head is large and flatted on the crown; the eyes are pretty large, and their iris grey with a tinge of yellow: the beak is of a kind of triangular figure, compreſſed at the ſides, and a little hooked juſt at the extremity: the wings and tail are ſhort, the feet ſtand backward, and the toes are connected by a membrane. See the article ALCA.

PENICHE, a port-town of Portugal, in the province of Eſtremadura, ſituated on the Ocean, forty miles north of Liſbon: weſt long. 9° 6′, north lat. 39° 20′.

PENICK, a town of Germany, in the marquiſate of Miſnia, ſituated ſixteen miles ſouth eaſt of Altenburg.

PENICILLA, in pharmacy, a lozenge, or form of medicine, made round by rolling. See the article LOZENGE.

PENICILLUS, among ſurgeons, is uſed for a tent to be put into wounds or ulcers. See the article TENT.

PENIDIUM SACCHARUM, in pharmacy, is prepared thus: diſſolve ſugar as much as you pleaſe, clarify it with the white of an egg; then ſtrain and inſpiſſate it gently, or ſlowly, till great bubbles ariſe: this done take it off the fire till the bubbles ſubſide, and then pour it out upon a board which has been rubbed over with oil of almonds; and when it is ſomewhat hardened, take it up with your hook, and with your hand ſprinkled with ſtarch, ſpeedily reduce it into its proper form, and lay it up for uſe.

It is good againſt colds, to moderate the acrimonies of the breaſt, promote expectoration, *&c.*

PENINSULA, in geography, a portion or extent of land, joining to the continent by a narrow neck, or iſthmus; the reſt being encompaſſed with water.

PENIS, the YARD, in anatomy, the primary organ of generation in man; being called alſo mentula, virgo, priapus, and by a multitude of other names.

Anato-

Anatomiſts divide the penis into three parts, the body, the glans, and the urethra. In the body of the penis, are obſervable the cuticle and cutis, as the common integuments; the prepuce, being a reduplication of the cutis covering the glans; and in the lower part of this is fixed the frenulum, all which are deſcribed under their ſeveral heads. See the articles CUTICLE, CUTIS, PREPUCE, and FRÆNUM.

After theſe is obſervable the proper teguments or coats of the penis. This is a robuſt coat, of a membranous nature, ſurrounding every part of the penis. It is ſometimes double, and has in the interſtitial ſpace a celluloſe coat which is diſcoverable by inflation and drying in that ſtate. Under this are the two bodies which conſtitute the penis; theſe, being called the corpora cavernoſa, or ſpongioſa, are deſcribed under the article CAVERNOSE.

For a deſcription of the other two parts of the penis, *viz.* the glans and urethra, ſee GLANS and URETHRA.

The penis is joined by ſynchondroſis to the oſſa pubis, by means of a ligament called ligamentum Veſalii, as alſo by its lateral ligaments. The muſcles of the penis are numerous: they ſerve principally for the erecting it. See MUSCLE.

The veſſels of the penis are very numerous, and are diſtributed through it in a very ſurpriſing and beautiful manner. To the conſideration of the penis there yet alſo belong the glands, called from their diſcoverer glandulæ Cowperi mucoſæ: he deſcribes three of them, two of which are ſituated regularly one on each ſide of the urethra, between the muſculi acceleratores and the bulb: they are ſaid to be of an oval figure, but ſomewhat compreſſed, and of the ſize of a horſe-bean. They ſecrete a mucous pellucid liquor, which each diſcharges at its own duct into the urethra; the uſe of the fluid which they ſecrete ſeems to be that of lubricating the urethra, and defending it from being hurt by the acrimony of the urine. The third of them, which is ſingle, is in the angle of the curvature of the urethra, under the os pubis, and within the corpus cavernoſum: ſuch are the glandulæ Cowperi. Finally, the glandula Littrii is ſituated juſt below the proſtata, and lodged between the two membranes and coats of the urethra: the uſe of this gland is the ſame with thoſe already deſcribed. The veſſels of the penis, urethra, and theſe glands, are in common: their arteries are from the hypogaſtrics, and thoſe of the pudenda: the veins, which all have valves, carry back the blood to the veins of the ſame parts; but before they join them, they make various anaſtomoſes, and form a wonderful kind of reticulation in the body of the penis. The nerves come from the laſt of thoſe of the os ſacrum, and the lymphatic veſſels are numerous.

The uſes of the penis are two, *viz.* a primary and a ſecondary: the primary uſe of it is to ſerve in the office of generation, and the ſecondary for the excretion of the urine.

For the diſorders of the penis, ſee the articles GONORRHOEA, *with its ſymptoms* PHIMOSIS, PARAPHIMOSIS, *&c.*

PENISCOLA, a port-town of Spain, in the province of Valencia, ſituated on the Mediterranean, under the meridian of London, and in north lat. 40° 29′.

PENITENCE, *pœnitentia*, properly ſignifies the ſame with repentance; but is alſo uſed for the diſcipline, or puniſhment, more uſually called penance. See the article PENANCE.

There are ſeveral orders of penitence, conſiſting either of converted debauchees, reformed proſtitutes, or perſons who devote themſelves to the office of reforming them: ſuch are the order and congregation of penitence of St. Magdalen, in France; the converts of the name of Jeſus, at Seville; and the penitents of Orvietto.

PENITENTS, an appellation given to certain fraternities of penitents diſtinguiſhed by the different ſhape and colour of their habits. Theſe are ſecular ſocieties, who have their rules, ſtatutes, and churches, and make public proceſſions under their particular croſſes or banners. Of theſe there are more than a hundred, the moſt conſiderable of which are as follows: the white penitents, of which there are ſeveral different ſorts at Rome, the moſt antient of which was conſtituted in 1264: the brethren of this fraternity every year give portions to a certain number of young girls, in order to their being married: their habit is a kind of white ſackcloth, and on the ſhoulder is a circle, in the middle of which is a red and white croſs. Black penitents, the moſt conſiderable of which are the brethren of mercy, inſtituted in 1488, by ſome Florentines, in order to aſſiſt criminals

minals during their impriſonment, and at the time of their death: on the day of execution, they walk in proceſſion before them, ſinging the ſeven penitential pſalms and the litanies; and after they are dead, they take them down from the gibbet and bury them: their habit is black ſackcloth. There are others, whoſe buſineſs it is to bury ſuch perſons as are found dead in the ſtreets: theſe wear a death's head on one ſide of their habit. There are alſo blue, grey, red, green, and violet penitents; all which are remarkable for little elſe beſides the different colours of their habits.

Mabillon tells us, that at Turin there are a ſet of penitents kept in pay to walk through the ſtreets in proceſſion, and cut their ſhoulders with whips, *&c.*

PENITENTIAL, an eccleſiaſtical book retained among the romaniſts; in which is preſcribed what relates to the impoſition of penance, and the reconciliation of penitents. See the article PENANCE. There are various penitentials, as the roman penitential, that of the venerable Bede, that of pope Gregory III. *&c.*

PENITENTIARY, in the antient chriſtian church, a name given to certain preſbyters, or prieſts, appointed in every church to receive the private confeſſions of the people, in order to facilitate public diſcipline, by acquainting them what ſins were to be expiated by public penance, and to appoint private penance for ſuch private crimes as were not proper to be publicly cenſured.

PENITENTIARY, at the court of Rome, is an office in which are examined and delivered out the ſecret bulls, graces, or diſpenſations relating to caſes of conſcience, confeſſions, *&c.*

PENITENTIARY is alſo an officer, in ſome cathedrals, veſted with power from the biſhop to abſolve, in caſes reſerved to him. The pope has at preſent his grand penitentiary, who is a cardinal, and the chief of the other penitentiary prieſts eſtabliſhed in the church of Rome, who conſult him in all difficult caſes. He preſides in the penitentiary, diſpatches diſpenſations, abſolutions, *&c.* and has under him a regent and twenty-four proctors, or advocates of the ſacred penitentiary.

PENKRIDGE, a market-town, four miles ſouth of Stafford.

PENMANMAUR, one of the higheſt mountains in Wales, in Carnarvonſhire.

PENNAFLOR, a town of Spain, in Aſturias, fifteen miles ſouth-weſt of Orviedo.

PENNATED, or PINNATED, among botaniſts. See the article PINNATED.

PENNON, or PENON, a kind of ſtandard, with a long tail, antiently belonging to a ſimple gentleman. It is oppoſed to the banner, which was ſquare. See the article BANNER.

PENNY, an antient ſilver-coin, which, though now little uſed, was the only one current among our ſaxon anceſtors. See the article COIN.

PENNY-EARTH, in agriculture, denotes a hard, loamy, or ſandy earth, with a large proportion of ſea-ſhells intermixed with it.

PENNY-POST. See the article POST.

PENNY-WEIGHT, a troy-weight, containing twenty-four grains, each of which is equal in weight to a grain of wheat, gathered out of the middle of the ear, and well dried. See WEIGHT.

PENON, or PENNON. See PENNON.

PENON DE VELEZ, a port-town of Barbary, ſituated on the Mediterranean, eighty miles ſouth-eaſt of the Streights of Gibraltar.

PENRISE, a port-town of Wales, in the county of Glamorgan, ſituated on Briſtol-channel, ſeventeen miles ſouth of Caermarthen.

PENRITH, a market-town of Cumberland, ſixteen miles ſouth of Carliſle.

PENRYN, a borough-town of Cornwal, near a bay of the Engliſh-channel: weſt long. 5° 35′, north lat. 50° 20′. It ſends two members to parliament.

PENSANCE, a market-town of Cornwal, eight miles eaſt of the Land's end.

PENSILVANIA, one of the engliſh plantations in America, two hundred miles in length, and almoſt as much in breadth: ſituated between 74 and 78° of weſt longitude, and between 39 and 42° of north latitude: a fine fruitful country, bounded by the five nations of the Iroquois on the north; by New-Jerſey and New-York on the eaſt; and by Maryland on the ſouth and weſt. It is a proprietary government, the heirs of Mr. Penn, a quaker, who ſettled this country, appointing the governor.

PENSION, a ſum of money paid annually for ſervices or conſiderations already paſt. The yearly payment of each member to the houſes of the inns of courts, are likewiſe termed penſions; and the yearly aſſembly

ſembly of the members of the ſociety of Gray's Inn, to conſult on the affairs of the houſe, is alſo called a penſion.

PENSIONARY, or PENSIONER, a perſon who has an appointment, or yearly ſum, payable during life, by way of acknowledgment, charged on the eſtate of a prince, company, or particular perſon. See the article ANNUITY.

Grand PENSIONARY, an appellation given to the firſt miniſter of the States of Holland. The grand penſionary is chairman in the aſſemblies of the ſtates of that province; he propoſes the matters to be conſulted on; collects the votes; forms and pronounces the reſolutions of the ſtates; opens letters; confers with foreign miniſters, *&c.* His buſineſs is alſo to inſpect the finances, to maintain the authority of the ſtates, and to ſee that the laws are obſerved; and he is perpetual deputy of the ſtates-general of the United Provinces. His commiſſion is however given him only for five years; after which it is deliberated whether or no it ſhall be renewed; but there is no inſtance of its being revoked: therefore death only puts an end to the functions of this important miniſter.

PENSIONARY, is alſo the firſt miniſter of the regency of each city in Holland. His office is to give his advice in affairs relating to the government either of the ſtate in general, or of the city in particular; and in aſſemblies of the ſtates of the province, he is ſpeaker in behalf of his city. The function, however, of theſe penſionaries is not every where alike: in ſome cities they only give their advice, and are never found in aſſemblies of the magiſtrates, except when expreſly called thither: in others they attend conſtantly; and in others they make the propoſitions on the part of the burgomaſters, draw up their concluſions, *&c.* They are called penſionaries, becauſe they receive an appointment or penſion.

PENSIONER, in general, denotes a perſon who receives a penſion, yearly ſallary, or allowance. Hence,

The band of gentlemen-penſioners, the nobleſt ſort of guard to the king's perſon, conſiſts of forty gentlemen, who receive a yearly penſion of one hundred pounds. This honourable band was firſt inſtituted by king Henry VIII. and their office is to attend the king's perſon, with their battle-axes, to and from his chapel-royal, and to receive him in the preſence chamber, or coming out of his privy-lodgings: they are alſo to attend at all great ſolemnities, as coronations, St. George's feaſt, public audiences of embaſſadors, at the ſovereign's going to parliament, *&c.*

They are each obliged to keep three double horſes and a ſervant, and ſo are properly a troop of horſe. They wait half at a time, quarterly; but on Chriſtmas-day, Eaſter-day, Whitſunday, *&c.* and on extraordinary occaſions, they are all obliged to give their attendance. They have likewiſe the honour to carry up the ſovereign's dinner on the coronation-day, and St. George's feaſt; at which times, the king or queen uſually confer the honour of knighthood on two ſuch gentlemen of the band as their captain preſents.

Their arms are gilt battle-axes; and their weapons, on horſe-back, in time of war; are curaſſiers-arms, with ſword and piſtols. Their ſtandard, in time of war, is, argent, a croſs gules. Their captain is always a nobleman, who has under him a lieutenant, a ſtandard-bearer, a clerk of the check, ſecretary, paymaſter, and harbinger.

PENSTOCK, a ſluice, or flood-gate, ſerving to retain or let go, at pleaſure, the water of a mill-pond, or the like. See the article SLUICE.

PENTACHORD, an antient muſical inſtrument, with five ſtrings, whence the name.

The ſtrings were of bullocks-leather, and ſtruck with a plectrum made of goats-horn.

PENTACROSTIC, in poetry, a ſet of verſes ſo diſpoſed as that there are always five acroſtics of the ſame name, in five diviſions of each verſe. See ACROSTIC.

PENTAEDROSTYLA, in natural hiſtory, the name of a genus of ſpars. See the article SPAR.

The bodies of this genus are ſpars, in form of pentangular columns, terminated by pentangular pyramids at one end, and irregularly affixed at the other to ſome ſolid body.

Of this genus there are three known ſpecies. 1. One with a very long pyramid. This is found in the mines on Mendip-hills. 2. One with a thick column, and a very ſhort and large pyramid. This is found in the Hartz-foreſt in Germany, and in Cumberland. And, 3. One with a broad depreſſed pyramid. This is found, ſo far as it is yet known, only in the mines at Rammelſberg in the Hartz-foreſt in Germany.

PEN-

PENTAGON, in geometry, a figure of five ſides and five angles.

If the five ſides be equal, the angles are ſo too, and the figure called a regular pentagon: ſuch is A B C D E (plate CXCVI. fig. 4.) inſcribed in the circle.

The moſt conſiderable property of a pentagon is, that one of its ſides, D E, is equal in power to the ſides of a hexagon and a decagon, inſcribed in the ſame circle A B C D E; that is, the ſquare of the ſide D E, is equal to the ſum of the ſquares of the ſides *d* E and E *b*.

The area of a pentagon, like that of any other polygon, may be obtained by reſolving it into triangles. See the articles TRIANGLE and POLYGON.

Pappus has alſo demonſtrated, that twelve regular pentagons contain more than twenty triangles inſcribed in the ſame circle, lib. v. probl. 45.

The dodecahedron, which is the fourth regular ſolid, conſiſts of twelve pentagons.

In fortification, pentagon denotes a fort with five baſtions.

PENTAGRAPH, or PARALLELOGRAM, an inſtrument whereby deſigns of any kind may be copied in what proportion you pleaſe, without being ſkilled in drawing.

It conſiſts of four braſs or wooden rulers, (plate CXCVI. fig. 5.) two of them from fifteen to eighteen inches long; the other two half that length. At the ends and middle of the long rulers, as alſo at the ends of the ſhorter, are holes, upon the exact fixing whereof, the perfection of the inſtrument chiefly depends. Thoſe in the middle of the long rulers are to be at the ſame diſtance from thoſe at the ends of the long ones, and thoſe of the ſhort ones, ſo as to form a parallelogram.

It is fitted together by a large pillar *a*, having at one end a ſcrew and nut, whereby the two long rulers are joined, and at the other a little knot for the inſtrument to ſlide on: *b* is a rivet with a ſcrew and nut, wherewith each ſhort ruler is faſtened to the middle of each long one: *c* is a pillar, one end whereof, being hollowed into a ſcrew, has a nut fitted to it; at the other end is a worm to ſcrew into the table; when the inſtrument is to be uſed, it joins the ends of the two ſhort rulers: *d* is a pen or pencil ſcrewed into a little pillar: *e* is a braſs-point, moderately blunt, ſcrewed, likewiſe, into a little pillar.

Uſe of the PENTAGRAPH. 1. To copy a deſign in the ſame ſcale as the original: ſcrew the worm *c* into the table; lay a paper under the pencil *d*, now placed at *f*, and the deſign under the point *e*, now placed at *g*; then, conducting the point over the ſeveral lines of the deſign, the pencil *f* will draw the ſame on the paper.

2. If the deſign be to be reduced into half, &c. the ſpace, the worm muſt be placed at the end of the long ruler *d*, and the paper and pencil on the middle. In this ſituation conduct the braſs-point as before, and the pencil will draw its copy in the proportion required, the pencil here moving half the length that the point does.

On the contrary, if the deſign be to be enlarged by one half, the braſs point, with the deſign, muſt be placed in the middle at *c*, the pencil and paper at the end of the long ruler, and the worm at the other.

3. To enlarge or reduce in other proportions, there are holes drilled at equal diſtances on each ruler, namely, all along the ſhort ones, and half way the long ones, in order for placing of the braſs-point, pencil, and worm, in a right line therein; that is, if the piece carrying the point be put in the third hole, the two other pieces muſt be put in its third hole.

If then the point and deſign be placed at any hole of the great ruler, and the pencil with the paper at any hole of the ſhort ruler, which forms the angle therewith, the copy will be leſs than half the original. On the contrary, if it be placed at one of the holes of that ſhort ruler, which is parallel to the long ruler, the copy will be greater than half the original.

Few of theſe inſtruments will do any thing tolerably but ſtraight lines, and many of them not thoſe.

PENTAMETER, in antient poetry, a kind of verſe conſiſting of five feet, or metres; whence the name.

The two firſt feet may be either dactyls or ſpondees, at pleaſure; the third is always a ſpondee, and the two laſt anapeſts: ſuch is the following verſe of Ovid.

1 2 3 4 5
Carmini|bus vi|ves tem|pus in o|mne meis.

A pentameter verſe, ſubjoined to an hexameter, conſtitutes what is called elegiac. See the article ELEGIAC.

PENTANDRIA, in botany, one of Linnæus's

næus's claſſes of plants, the fifth in order; the characters of which are, that all the plants comprehended in it have hermaphrodite flowers, with five ſtamina or male parts in each: they are ſubdivided into orders, which are denominated monogynia, digynia, trigynia, &c. according as there are one, two, three, &c. piſtils, or female parts, in each flower. See the article STAMINA.

To this genus belongs the vine, of the order of the monogynia; the elm, of the digynia; ſumach, of the trigynia, &c.

PENTAPETALOUS, an appellation given to flowers that conſiſt of five petals or leaves. See the article FLOWER.

PENTAPETES, in botany, a genus of the monadelphia-polyandria claſs of plants, the calyx of which is ſimple; the ſtamina are at leaſt twenty in number, five of which are very long and ſterile, and the fruit is a capſule, containing five cells, with membranaceous ſeeds.

PENTAPOLIS, in geography, denotes a country wherein are only five cities: ſuch was the pentapolis of Egypt, or Cyrenaica, which contained the five cities Berenice, Arſinoë, Ptolemais, Cyrene, and Apollonia.

PENTAPTOTON, in grammar, denotes a noun which has only five caſes.

PENTASTICH, πενταστιχον, in poetry, a ſtanza, or diviſion of a poem, conſiſting of five verſes; whence the name.

PENTASTYLE, in architecture, a building wherein there are five rows of columns. See the article COLUMN.

PENTATEUCH, πεντατευχος, an appellation given to the firſt five books of the Old Teſtament, *viz.* Geneſis, Exodus, Leviticus, Numbers, and Deuteronomy. See the article GENESIS, &c.

The Samaritans acknowledge no other ſcriptures beſides the Pentateuch, which they ſtill preſerve in the old hebrew or phœnician character, as alſo in the vulgar ſamaritan.

PENTATHLON, in antiquity, a general name for the five exerciſes performed at the grecian games, *viz.* wreſtling, boxing, leaping, running, and playing at the diſcus. See the articles GAMES, WRESTLING, &c.

PENTATONON, in the antient muſic, a concord called by us the redundant ſixth. See the article SIXTH.

PENTECOST, a ſolemn feſtival of the Jews, ſo called becauſe it was celebrated on the fiftieth day after the ſixteenth of the month Niſan, which was the ſecond day of the paſſover. See PASSOVER.

The feaſt of pentecoſt was inſtituted in memory of the law's being given, on the fiftieth day after the Iſraelites came out of Egypt.

It was on the feaſt of pentecoſt that the Holy Ghoſt miraculouſly deſcended on the apoſtles. See WHITSUNDAY.

PENTELASMIS, in the hiſtory of ſhell-fiſh, a genus of animals, compoſed of a fleſhy body, affixed to a fleſhy and ſoft pedicle; the body is compoſed of five valves, and the pedicle is ſometimes ſhort, and in other ſpecies conſiderably long. The animal, inhabiting the ſhell-body of this genus, is a triton. See the article TRITON.

This genus comprehends the gooſe-ſhell, or barnacle, being a tender, brittle ſhell, about an inch long, and three quarters of an inch in diameter. See the article CONCHA ANATIFERA.

PENTHEMIMERIS, in antient poetry, a part of a verſe conſiſting of two feet and a long ſyllable.

PENTHORUM, in botany, a genus of the decandria pentagynia claſs of plants, without any flower-petals; the fruit is a ſingle capſule, divided into five parts, with five conic angles, and containing five cells, with numerous ſeeds in each.

PENULTIMA, or PENULTIMATE SYLLABLE, in grammar, denotes the laſt ſyllable but one of a word; and hence the anti-penultimate ſyllable is the laſt but two, or that immediately before the penultima.

PENULTIMATE CHORD, in muſic, according to Broſſard, is the ſame with what the Greeks call paranete, though others will have the paranete to be only the next chord to the ultimate.

PENULTIMATE *of the ſeparate, paranete diazeugmenon*, a name the antients gave to one of the chords of their lyre or ſyſtem, correſponding to the *de, la, re* of the third octave of the modern ſyſtem.

PENULTIMATE *of the acute, paranete hyperbolæon*, a chord of the antient ſyſtem, anſwering to the *ge, re, ſol* of the third octave of the modern ſyſtem.

PENUMBRA, in aſtronomy, a partial ſhade obſerved between the perfect ſhadow and the full light in an eclipſe.

It ariſes from the magnitude of the ſun's body; for were he only a luminous point, the ſhadow would be all perfect; but by reaſon of the diameter of the ſun, it happens that a place which is not illuminated by the whole body of the ſun, does yet receive

receive rays from a part thereof. See the article ECLIPSE.

PEPASMUS, in medicine, denotes the digesting and concocting of morbid humours.

PEPASTIC, or PEPTIC, in physic, are medicaments of the consistence of an emplaister, for bringing humours to a head, and disposing them to maturation.

PEPLIS, WATER-PURSLAIN, in botany, a genus of the hexandria-digynia class of plants, the flower of which consists of five very small oval petals; and its fruit is a cordated bilocular capsule, containing numerous very small and triquetrous seeds.

PEPO, the POMPION, in botany, is comprehended by Linnæus among the cucurbita. See the article CUCURBITA.

PEPPER, *piper*, in natural history, an aromatic berry, of a hot dry quality, chiefly used in seasoning.

We have three kinds of pepper at this time in use in the shops; the black, the white, and the long pepper.

Black pepper is the fruit of a plant of the diandria-trigynia class, without any flower-petals: the fruit itself is roundish and rugose, and disposed in clusters: it is brought from the dutch settlements in the East-Indies. See plate CC. fig. 3.

The common white pepper is factitious, being prepared from the black in the following manner: they steep this in sea-water, exposed to the heat of the sun for several days, till the rind or outer bark loosens; they then take it out, and when it is half dry, rub it till the rind falls off; then they dry the white fruit, and the remains of the rind blow away like chaff. A great deal of the heat of the pepper is taken off by this process; so that the white kind is fitter for many purposes than the black. However, there is a sort of native white pepper, produced on a species of the same plant, which is much better than the factitious, and indeed little inferior to the black.

The long pepper is a dried fruit of an inch or an inch and an half in length, and about the thickness of a large goose-quill: it is of a brownish-grey colour, cylindrical in figure, and said to be produced on a plant of the same genus.

Pepper is principally used by us in food, to assist digestion; but the people in the East Indies esteem it as a stomachic, and drink a strong infusion of it in water by way of giving them an appetite: they have also a way of making a fiery spirit of fermented fresh pepper with water, which they use for the same purposes. They have also a way of preserving the common and long pepper in vinegar, and eating them afterwards at meals.

Common pepper pays a duty, on importation, of 2 s. $4\frac{1}{2}$ d. per pound; but if imported immediately from the place of growth in british shipping, it pays only $\frac{47\frac{1}{2}}{100}$ d. per pound. Long pepper pays, on importation, $2\frac{32\frac{1}{2}}{100}$ d. the pound; and draws back, on exportation, $2\frac{4}{100}$ d.

Chiapa PEPPER, is thought to be the same with Jamaica-pepper.

Jamaica PEPPER, *pimenta*, in botany. See the article PIMENTA.

Indian PEPPER, or *Guinea*-PEPPER, *capsicum*, in botany. See CAPSICUM.

Poor man's PEPPER, or PEPPER WORT, a name given to lepidium. See LEPIDIUM.

Water-PEPPER, is only a species of sedum, or house leek.

PEPPER-BIRD, the english name of a species of ramphastos, with a yellow rump. See the article RAMPHASTOS.

All the species of ramphastos are fond of pepper, but this eats it the most voraciously of them all; whence its english name: it is about the size of our jack-daw; and its beak is six inches, or more, in length, and three inches in diameter at the base.

PEPPER-EEL, in the history of animalcules, a species of enchelis, found in pepper-water and other vegetable infusions. See the articles ENCHELIS and PEPPER-WATER.

PEPPER-MINT, a species of mint. See the article MINT.

PEPPER-WATER, a liquor prepared in the following manner, for microscopical observations: put common black pepper, grossly powdered, into an open vessel so as to cover the bottom of it half an inch thick, and put to it rain or river water, till it covers it an inch; shake or stir the whole well together at the first mixing, but never disturb it afterwards: let the vessel be exposed to the air uncovered; and in a few days there will be seen a pellicle or thin skin swimming on the surface of the liquor, looking of several colours.

This is a congeries of multitudes of small animals; and being examined by the microscope, will be seen all in motion: the animals, at first sight, are so small as not to be distinguishable, unless

to the greateſt magnifiers; but they grow daily till they arrive at their full ſize. Their numbers are alſo continually increaſing, till the whole ſurface of the liquor is full of them, to a conſiderable depth. When diſturbed they will ſometimes all dart down to the bottom, but they ſoon after come up to the ſurface again. The ſkin appears ſooneſt in warm weather, and the animals grow the quickeſt; but in the ſevereſt cold it will ſucceed, unleſs the water freezes.

About the quantity of a pin's head of this ſcum, taken up on the nib of a new pen, or the tip of a hair-pencil, is to be laid on a plate of clear glaſs; and if applied firſt to the third magnifier, then to the ſecond, and, finally, to the firſt, will ſhew the different animalcules it contains, of ſeveral kinds and ſhapes as well as ſizes.

PEPSIS, among phyſicians, denotes the concoction of food or humours in the body. See the article CONCOCTION.

PEPUS, or PEIBUS, a lake ſituated on the confines of Livonia, has a communication with the gulph of Finland, and the lake Werſero in the dominions of Ruſſia.

PEQUIGNY, a town of Picardy, in France, fifteen miles ſouth of Abbeville.

PERA, one of the ſuburbs of Conſtantinople, where ambaſſadors and chriſtians uſually reſide.

PERAMBULATION, in law, ſignifies the walking about a foreſt, pariſh, or the like, by juſtices or others, in order to mark down and preſerve the limits and bounds thereof.

PERAMBULATIONE FACIENDA, a writ commanding the ſheriff to make perambulation, in order to ſettle the bounds of two adjoining manors.

This writ is only iſſued, where the two lords of the manors agree to ſuch perambulation; for if either of them refuſe, the other ſhall have the writ de rationabilibus diviſis. See RATIONABILIBUS.

PERAMBULATOR, in ſurveying, an inſtrument for meaſuring diſtances, called alſo pedometer, way-wiſer, and ſurveying-wheel.

It conſiſts of a wheel AA (pl. CXCVII. fig. 1. n° 1.) two feet ſeven inches and a half in diameter; conſequently, half a pole, or eight feet three inches in circumference. On one end of the axis is a nut, three quarters of an inch in diameter, and divided into eight teeth; which, upon moving the wheel round, fall into the eight teeth of another nut *c* (*ibid.* n° 2.) fixed on one end of an iron-rod Q, and thus turn the rod once round, in the time the wheel makes one revolution. This rod, lying along a groove in the ſide of the carriage of the inſtrument, under the dotted line, has at its other end a ſquare hole, into which is fitted the end *b* of a ſmall cylinder P. This cylinder is diſpoſed (*ibid.* n° 3.) under the dial-plate of a movement, at the end of the carriage B, in ſuch a manner as to be moveable about its axis: its end *a* is cut into a perpetual ſcrew, which falling into the thirty-two teeth of a wheel perpendicular thereto, upon driving the inſtrument forward, that wheel makes a revolution each ſixteenth pole. On the axis of this wheel is a pinion with ſix teeth, which, falling into the teeth of another wheel of ſixty teeth, carries it round every hundred and ſixtieth pole, or half a mile.

This laſt wheel, carrying a hand or index round with it over the diviſions of a dial plate, whoſe outer limb is divided into one hundred and ſixty parts, correſponding to the one hundred and ſixty poles, points out the number of poles paſſed over. Again, on the axis of this laſt wheel is a pinion, containing twenty teeth, which, falling into the teeth of a third wheel, which hath forty teeth, drives it once round in three hundred and twenty poles, or a mile. On the axis of this wheel is a pinion of twelve teeth, which, falling into the teeth of a fourth wheel, having ſeventy-two teeth, drives it once round in twelve miles.

This fourth wheel, carrying another index over the inner limb of the dial-plate, divided into twelve for miles, and each mile ſubdivided into halves, quarters, and furlongs, ſerves to regiſter the revolutions of the other hand, and to keep account of the half miles and miles paſſed over as far as twelve miles.

The uſe of this inſtrument is obvious from its conſtruction. Its proper office is in the ſurveying of roads and large diſtances, where a great deal of expedition, and not much accuracy, is required. It is evident, that driving it along, and obſerving the hands, has the ſame effect as dragging the chain, and taking account of the chains and links.

Its advantages are its handineſs and expedition; its contrivance is ſuch, that it may be fitted to the wheel of a coach, in which ſtate it performs its office, and meaſures the road without any trouble at all.

Fig. 1. PERAMBULATOR

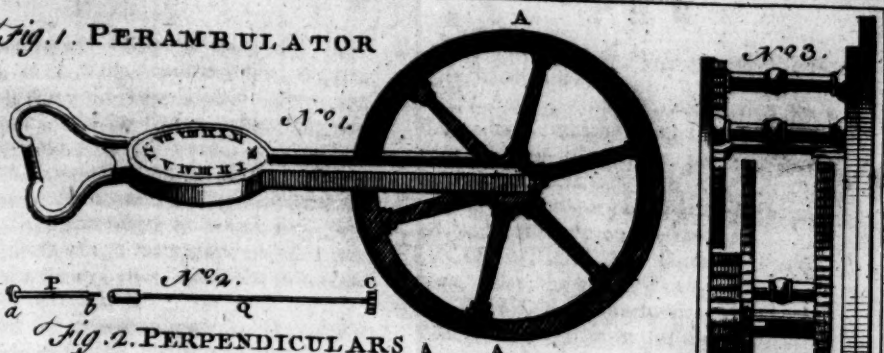


Fig. 2. PERPENDICULARS

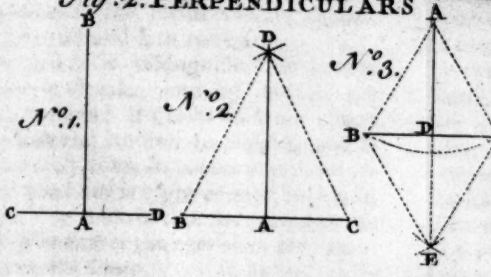


Fig. 3. PINNATED LEAVES.

Fig. 4.

The Horned Indian PHEASANT

Fig. 6. PILE

Fig. 5. PETARD.

T. Jefferys sculp

BRITISH MUSEUM

PER ARSIN ET THESIN, in muſic. Per arſin, in a ſong, counterpoint, figure, *&c.* is when the notes aſcend from grave to acute; and per theſin, when they deſcend from acute to grave.

PERCA, the PEARCH, in ichthyology, a genus of the acanthopterygious order of fiſhes, the characters of which are, that the branchioſtege membrane on each ſide contains ſeven bones, and the back has one or two fins.

Beſides the common pearch, this genus comprehends the lucius and lucioperca. See LUCIUS and LUCIOPERCA.

The pearch is diſtinguiſhed by ſeveral tranſverſe ſtreaks, and by having the belly fins red: it grows in ſome places to a foot and an half in length, and is conſiderably thick in proportion; but its more uſual ſize is eight or nine inches in length: its noſtrils are large and patulous, and nearer the eyes than the extremity of the ſnout.

PERCASLAW, or PEREJESLAW, a city of the Ukrain, in Ruſſia, forty-four miles ſouth-eaſt of Kiof.

PERCEPTION, in logic, the firſt and moſt ſimple act of the mind, whereby it perceives or is conſcious of its ideas. See the article IDEA.

In bare perception, the mind is for the moſt part only paſſive; yet impreſſions made on the ſenſes cauſe no perception, unleſs they are taken notice of by the mind, as we ſee in thoſe who are intently buſied in the contemplation of certain objects. It ought alſo to be obſerved, that the ideas we receive by perception are often altered by the judgment, without our taking notice of it; ſo that we take that for the perception of our ſenſes, which is but an idea formed by the judgment: thus, a man who reads, or hears, with attention, takes little notice of the characters or ſounds, but of the ideas excited in him by them. See the article JUDGMENT.

The faculty of perception ſeems to be that which conſtitutes the diſtinction between the animal kingdom and the inferior parts of nature. Perception is alſo the firſt ſtep towards knowledge, and the inlet of all the materials of it; ſo that the fewer ſenſes a man has, and the duller the impreſſions that are made by them are, the more remote he is from that knowledge which is to be found in other men. See KNOWLEDGE.

PERCH, or PEARCH, *perca*. See PERCA.

PERCH, a meaſure of length. See the article MEASURE.

PERCHANT, among fowlers, denotes a decoy-bird, which being faſtened by the foot, flutters about the place to draw other birds to it.

PERCHE, a territory of Orleanois, bounded by Normandy on the north.

PERCOLATION, the ſame with filtration. See the article FILTRATION.

PERCUSSION, in mechanics, the impreſſion a body makes in falling or ſtriking upon another, or the ſhock of two bodies in motion. See the article MOTION.

Percuſſion is either direct or oblique; direct, when the impulſe is given in a line perpendicular to the point of contact; and oblique, when it is given in a line oblique to the point of contact. See the article CENTER.

The ratio which an oblique ſtroke bears to a perpendicular one, is as the ſine of the angle of incidence to the radius. Thus, let *a b* (plate CXCVI. fig. 6.) be the ſide of any body on which an oblique force falls, with the direction *d a*; draw *d c* at right angles to *d b*, a perpendicular let fall from *d* to the body to be moved, and make *a d* the radius of a circle; it is plain that the oblique force *d a*, by the laws of compoſition and reſolution of motions, will be reſolved into the two forces *d c* and *b d*; of which *d c*, being parallel to *a b*, hath no energy or force to move that body; and, conſequently, *d b* expreſſes all the power of the ſtroke or impulſe on the body to be moved: but *d b* is the right ſine of the angle of incidence *d a b*; wherefore the oblique force *d a*, to one falling perpendicularly, is as the ſine of the angle of incidence to the radius.

PER DELIQUIUM. See DELIQUIUM.

PERDIX, the partridge. See the article PARTRIDGE.

PERDUES, or ENFANS PERDUES. See the article FORELORN HOPE.

PEREGRINE, among aſtrologers, a term applied to a planet, when found in a ſign where it has none of its five eſſential dignities.

PEREMPTORY, in law, where joined to a ſubſtantive, denotes a final and determinate act, without any hope of renewing or altering the ſame: thus we find peremptory day, action, mandamus, *&c.* in our law-books. But yet there may be what is called a putting off a peremptory, when the matter cannot be ſpoken

ſpoken to at the day fixed, on account of other buſineſs; and this is done by motion of the party, that the court will give a farther day without prejudice to him.

PERENNIAL, in botany, is applied to thoſe plants whoſe roots will abide many years, whether they retain their leaves in winter or not: thoſe which retain their leaves are called ever greens; but ſuch as caſt their leaves, are called deciduous, or perdifols. Some of theſe have annual ſtalks, which die to the root every autumn, and ſhoot up again in the ſpring; to which Jungius gives the title of radix reſtibilis.

PERENNIAL WINDS. See WIND.

PERETERION, a name which chirurgical writers give to the perforating part of the trepan. See the article TREPAN.

PERFECT, ſomething to which nothing is wanting; or that has all the requiſites of its nature and kind.

PERFECT, in arithmetic. Perfect number is that, all whoſe aliquot parts added together, make the ſame number with the number whereof they are ſuch parts.

PERFECT PRETERIT TENSE, in grammar. See the article PRETERIT.

PERFECT, in muſic, denotes ſomething that fills and ſatisfies the mind and the ear: in which ſenſe we ſay, perfect cadence, perfect concord, &c.

The antients had two kinds of concords, the major and minor, and each of theſe again was either perfect or imperfect. The word perfect, when joined to the words mode and time, uſually expreſſes triple time, or meaſure; in oppoſition to double time, which they called imperfect. See the article TIME.

PERFECTION, the ſtate or quality of a thing perfect. See the laſt article.

Perfection is divided, according to Chauvinus, into phyſical, moral, and metaphyſical. Phyſical or natural perfection, is that whereby a thing has all its powers or faculties, and thoſe too in full vigour; and all its parts both principal and ſecondary, and thoſe in their due proportion, conſtitution, &c. in which ſenſe man is ſaid to be perfect, when he has a ſound mind in a ſound body. This perfection is by the ſchools frequently termed ἐνεργητικὴ, becauſe a thing is enabled thereby to perform all its operations.

Moral perfection is an eminent degree of virtue or moral goodneſs, to which men arrive by repeated acts of piety, beneficence, &c. This is uſually ſubdivided into abſolute or inherent, which is actually in him to whom we attribute it; in imputative, which exiſts in ſome other, and not in him it is attributed to.

Metaphyſical, tranſcendental, or eſſential perfection, is the poſſeſſion of all the eſſential attributes, or of all the parts neceſſary to the integrity of a ſubſtance; or it is that whereby a thing has or is provided of every thing belonging to its nature. This is either abſolute, where all imperfection is excluded, ſuch is the perfection of God; or *ſecundum quid*, and in its kind.

PERFIDIA, in muſic, a term borrowed from the Italians, ſignifying an affection of doing always the ſame thing, of purſuing the ſame deſign, continuing the ſame motion, the ſame ſong, the ſame paſſage, and the ſame figures of notes. Such are the ſtiff or conſtrained baſſes, as thoſe of chacones, becauſe depending wholly on the caprice of the compoſer.

PERFORANS MANUS, in anatomy, a muſcle of the fingers, being the flexor of the third phalanx, called alſo profundus; which, ariſing at the upper part of the middle of the ulna, and dividing into four tendons, perforates the tendons of the perforatus manus, and is inſerted into the beginning of the third phalanx of the four fingers. See the article PERFORATUS, &c.

PERFORANS PEDIS, in anatomy, a muſcle of the toes, being the flexor of the third phalanx: its origin is from the hinder ſurface of the upper part of the tibia: towards the middle it is divided into four tendons, and theſe perforate the tendons of the perforatus pedis, and are afterwards terminated in the third phalanx.

PERFORATUS MANUS, in anatomy, a muſcle of the fingers, called alſo ſublimis, being the flexor of the ſecond phalanx, ariſing from the internal condyle of the humerus, and the radius: it is divided into four tendons, which are inſerted into the ſecond phalanges of the four fingers. See FLEXOR, &c.

PERFORATUS PEDIS, in anatomy, a muſcle of the toes, being the flexor of the ſecond phalanx, ariſing from the lower and inner ſurface of the calcaneum. It is divided into four tendons, which are perforated and is terminated in the bones of the ſecond phalanx.

PERFUME, *ſuffitus*, an agreeable artificial odour, affecting the organ of ſmelling.

The generality of perfumes are made up of

of muſk, ambergriſe, civet, roſe and cedar-woods, orange flowers, jaſmin, jonquils, tuberoſes, and other odoriferous flowers: thoſe drugs commonly called aromatics, ſuch as ſtorax, frankincenſe, benzoin, cloves, mace, &c. enter the compoſition of a perfume: ſome are alſo compoſed of aromatic herbs or leaves, as lavender, marjoram, ſage, thyme, hyſſop, &c.

Perfumes were antiently very much in uſe: but ſince people are become ſenſible of the harm they do to the head, they are generally diſuſed among us; however they are ſtill common in Spain and Italy.

PERFUMES, in pharmacy, are topical or external remedies, compoſed of certain powders and gums, which being mixed together, and thrown on the coals, produce a vapour and ſmoke of great uſe in ſeveral diſeaſes. There are dry perfumes made up in troches, pills, &c. of olibanum, maſtic, olives, &c. and moiſt viſcuous ones mixed with the juices of herbs.

By means of an oil diſtilled from tartar, Boerhaave obſerves, that rich perfumes may not only be exalted, but that muſk and civet may have their ſcent invigorated after being decayed, by ſuſpending them in a jakes.

PERGA, a port-town of european Turky, in the province of Albina, oppoſite to the iſland of Corfu, in eaſt long. 21°, north lat. 39° 20′.

PERGAMUS, an antient city of the leſſer Aſia, in the province of Phrygia, ſituated north of Smyrna.

PERIAGOGE, or PERIBOLE, in rhetoric, is uſed where many things are accumulated into one period which might have been divided into ſeveral.

PERIANTHIUM, in botany, expreſſes that ſort of cup of a flower which either conſiſts of ſeveral leaves, or elſe of one leaf divided into ſeveral ſegments, and ſurrounds the lower part of the flower. See the article CALYX.

PERIAPTON, περίαπτον, a kind of medicine otherwiſe called periamma, or amulet, which being tied about the neck, is ſuppoſed to prevent or cure diſeaſes. See the article AMULET.

PERICARDIUM, in anatomy, a membranaceous bag, looſely including the heart, and ſituated in the middle and lower part of the thorax, between the two lobes of the lungs. See HEART.

The figure of the pericardium is conic, like that of the heart itſelf. Its ſize is ſuch as can conveniently contain the heart without preſſing upon it. It is connected with the mediaſtinum, with a great part of the diaphragm, and with the large veſſels of the heart, which, together with this covering, ſuſtain alſo the heart itſelf in its place. In beaſts of moſt kinds, the heart is not at all connected with the diaphragm by its pericardium.

The pericardium is compoſed of a double membrane; the exterior one is common with the pleura and mediaſtinum; the interior one is proper, lubricous, and is continuous with the coats of the larger veſſels. This membrane, when expanded upon the finger, frequently diſcovers a great number of foraminula or little apertures. The arteries and veins of the pericardium are from thoſe of the mediaſtinum and diaphragm, and its nerves are alſo from the diaphragmatics. Its lymphatics all run to the thoracic duct.

The uſes of the pericardium are, 1. To ſupport the heart in a pendulous ſtate, eſpecially when we lie down. 2. To defend the heart from the cold air taken in at the lungs. 3. To preſerve it from being injured by water, by matter, or any other extraneous fluid in the cavity of the thorax. And, 4. To contain the liquor of the pericardium, as it is called, which ſerves to facilitate the motions of the heart.

The liquor of the pericardium is a fluid reſembling in appearance water in which raw fleſh had been waſhed. The anatomical writers in general deduce this fluid from certain glands ſituated either in the pericardium, or in the heart itſelf; but as theſe glands are not to be found, Heiſter thinks it more rational to ſuppoſe that it is expreſſed out of the auricles of the heart in its ſyſtole. The pericardium is found ſometimes in long hectics to cohere with the ſubſtance of the heart; and there are accounts of its having been wholly wanting.

PERICARPIA, in pharmacy, the ſame with epicarpia. See EPICARPIUM.

PERICARPIUM, among botaniſts, a covering or caſe for the ſeeds of plants. It is the germen of the piſtil enlarged: there are no leſs than nine ſpecies of pericarpia: 1. A capſule. 2. A conceptaculum. 3. A pod. 4. A legumen. 5. A nut. 6. A drupe. 7. An apple. 8. A berry. 9. A ſtrobilus. See CAPSULE, &c.

PERICHORUS, in antiquity, a name given by the Greeks to their profane games and combats, that is, to ſuch as were

were not conſecrated to any of the Gods. See the article GAMES.

PERICRANIUM, in anatomy, a thick ſolid coat, or membrane, covering the outſide of the cranium or ſkull. See the article SKULL.

Some call it by the general name of perioſteum, becauſe of its adhering to the bone: others divide it into two membranes, the under one whereof immediately inveſting the ſkull they call perioſteum, and the upper pericranium. In effect it is one double membrane, conſiſting, as moſt others do, of two coats. It is ſuppoſed to have its origin from the dura mater, which paſſing through the ſutures of the ſkull, by means of ſeveral filaments, forms this thick membrane; at leaſt it is found connected to the dura mater, by fibres tranſmitted from it to the membrane thro' the ſutures. About the origin of the temporal muſcles, the coats of the pericranium part; the outer paſſing over thoſe muſcles, and the inner ſtill adhering cloſe to the cranium. See the article PERIOSTEUM.

PERIDROME, *peridromus*, in antient architecture, the ſpace, gallery, alley, or the like, in a periptere, between the columns and the wall.

PERIGEE, *perigæum*, in aſtronomy, that point of the ſun's or moon's orbit, wherein they are at their leaſt diſtance from the earth, in which ſenſe it ſtands oppoſed to apogee. See the article APOGEE.

In the antient aſtronomy, perigee denotes that point in a planet's orbit, wherein the center of its epicycle is at the leaſt diſtance from the earth. See the article PTOLEMAIC SYSTEM.

PERIGRAPHE, a word uſually underſtood to expreſs a careleſs or inaccurate delineation of any thing; but in Veſalius it is uſed to expreſs the white lines or impreſſions that appear in the muſculus rectus of the abdomen.

PERIGUEUX, a city of France, in the province of Guienne, capital of the territory of Perigord, ſituated on the river Liſle, in eaſt long. 25', north lat. 45° 15'.

PERIHELIUM, in aſtronomy, that point of a planet's or comet's orbit, wherein it is in its leaſt diſtance from the ſun; in which ſenſe it ſtands in oppoſition to aphelium. See the article APHELIUM.

The antient aſtronomers, on account of their ſuppoſing the earth in the center of the ſyſtem, inſtead of this term uſed that of perigæum. See the article PERIGEE.

PERIMETER, in geometry, the bounds or limits of any figure or body. See the article FIGURE.

The perimeter of ſurfaces or figures are lines, thoſe of bodies are ſurfaces. In circular figures, inſtead of perimeter, we ſay circumference, or periphery. See the article CIRCUMFERENCE.

PERINÆUM, or PERINEUM, in anatomy, the ſpace between the anus and the parts of generation, divided into two equal lateral diviſions, by a very diſtinct line, which is longer in males than in females. The perinæum is ſubject to laceration in a difficult birth. In this part an operation is performed, called a puncture of the perinæum, or perforation made into the urethra and bladder, to diſcharge the urine when it is ſuppreſſed. See the articles DELIVERY, ISCHURY, PARACENTESIS, and PUNCTURE.

But the principal diſorders to which this part is ſubject, are abſceſſes and fiſtulas. See the articles ABSCESS and FISTULA.

PERINDE VALERE, a term in the eccleſiaſtical law, ſignifying a diſpenſation to a clerk, who, being deficient in his capacity, is nevertheleſs de facto admitted to a benefice, or other eccleſiaſtical function.

PERIOCHA, περιοχη, an argument indicating the ſum of a diſcourſe.

PERIOD, in aſtronomy, the time taken up by a ſtar or planet in making a revolution round the ſun; or the duration of its courſe till it return to the ſame point of its orbit. See the article ORBIT.

The periodical times of the planets round the ſun are as follow:

The period of	days.	hours.	min.	ſeconds
Mercury —	87	23	15	53
Venus — —	224	16	49	24
The earth —	365	6	9	14
Mars — —	686	23	27	30
Jupiter —	4332	12	20	25
Saturn — —	10759	6	36	26

See MERCURY, VENUS, &c.

There is a wonderful harmony between the diſtances of the planets from the ſun, and their periods round him; the great law whereof is, that the ſquares of the periodical times of the primary planets, are to each other as the cubes of their diſtances from the ſun; and likewiſe, the ſquares of the periodical times of the ſecondaries of any planet, are to each other as the cubes of their diſtances from that primary. This harmony among the planets is one of the greateſt confirmations

of the copernican hypotheſis. See the article COPERNICAN.

For the periods of the moon and ſatellites of jupiter and ſaturn, ſee the articles MOON and SATELLITE.

The periods of ſeveral comets are now pretty well aſcertained. See COMET.

PERIOD, in chronology, denotes a revolution of a certain number of years, or a ſeries of years, whereby, in different nations, and on different occaſions, time is meaſured; ſuch are the following.

Calippic PERIOD, a ſyſtem of ſeventy-ſix years. See CALIPPIC PERIOD.

The calippic period comprehends 48 common years, and 28 intercalary ones, 940 lunations, and 22759 days. See the article CYCLE.

Conſtantinopolitan PERIOD. See the article JULIAN PERIOD.

Dionyſian PERIOD, or *Victorian* PERIOD, a ſyſtem of 532 lunæ-ſolar and julian years, which being elapſed, the characters of the moon fall again upon the ſame day and feria, and revolve in the ſame order, according to the opinion of the antients.

This period is otherwiſe called the great paſchal cycle, becauſe the chriſtian church firſt uſed it, to find the true time of the paſcha, or eaſter. The ſum of theſe years ariſe by multiplying together the cycles of the ſun and moon. See the article EASTER.

Hipparchus's PERIOD, a ſyſtem of 304 years, both lunar and ſolar, which being elapſed, Hipparchus thought that the reckoning by the lunar motion would coincide again with the ſolar meaſures. This period comprehends 3760 lunar months, or 111039 days; the ſum of which ariſes from the multiplication of the calippic period by 4, ſubtracting unity from the product.

Julian PERIOD. See JULIAN.

Metonic PERIOD, that invented by Meton, being the ſame with the cycle of the moon. See the article CYCLE.

PERIOD, in grammar, denotes a ſmall compaſs of diſcourſe, containing a perfect ſentence, and diſtinguiſhed at the end by a point, or full ſtop, thus (.); and its members or diviſions marked by commas, colons, *&c.* See the articles POINT and SENTENCE.

The celebrated definition of Ariſtotle is, that a period is a diſcourſe which has a beginning, a middle, and an end, all viſible at one view. And De Colonia defines a period a ſhort but perfect ſentence, conſiſting of certain parts or members, depending one upon another, and connected together by ſome common vinculum.

The periods allowed in oratory are three, a period of two members, called by the Greeks dicolos, and by the Latins bimembris; a period of three members, tricolos, trimembris; and a period of four, tetracolos, quadrimembris: however, it is poſſible to introduce a period of one member, called by Ariſtotle monocolos, or ſimple period; but it will be reputed a flaw, and is a thing never practiſed by orators. The period may likewiſe be prolonged to five or ſix members; but then it changes its name, and inſtead of period commences what they call a periodical diſcourſe. The laws and meaſures of periods are pretty ſtrictly regarded by orators, particularly the antients. In oratory, the members of a period ſhould be equal, or nearly ſo, that the pauſes, or reſts of the voice, at the cloſe of each member, may be nearly equal; however, in writing not intended for rehearſal, this is not regarded; and common diſcourſe admits of periods, both longer and ſhorter than oratory.

Periods are ſaid to be round or ſquare, according to their different œconomy and cadences: ſquare period is that conſiſting of three or four equal members, formally diſtinguiſhed from each other; and a round period is that whoſe members or parts are ſo connected and fitted into each other, as that the junctures or commiſſures are ſcarce ſeen, but the whole ſides equally round, without any notable ſtops or inequalities.

PERIOD is alſo uſed for the character (.) wherewith the periods of diſcourſe are terminated, or expreſſed, being commonly called a full ſtop or point. See the article PUNCTUATION.

PERIOD, in numbers, a diſtinction made by a point, or comma, after every ſixth place or figure; and is uſed in numeration for the readier diſtinguiſhing and naming the ſeveral figures or places, which ſee under NUMERATION.

PERIOD *of a diſeaſe*, in medicine, is the time between the acceſs of one fit, or paroxyſm, and that of the next, including the entire exacerbation, decline, and intermiſſion, or remiſſion. Theſe, in ſome diſorders, are very regular and conſtant, as in intermitting fevers; but in chro-

nical diſorders, more irregular and uncertain, as in epilepſies: hence ſuch diſeaſes are called periodical.

PERIOD *of the blood*, is its circulation. See the article CIRCULATION.

PERIODEUTA, a church-officer among the Greeks, eſtabliſhed by the council of Laodicea, in towns where there were no biſhops; being a kind of rural dean.

PERIODIC, or PERIODICAL, ſomething that terminates and comprehends a period: ſuch is a periodic month, being the ſpace of time wherein the moon diſpatches her period; a periodic diſeaſe, *&c.* See MONTH, DISEASE, PERIOD, *&c.*

PERIOECI, περιοικοι, in geography, ſuch inhabitants of the earth, as have the ſame latitudes, but oppoſite longitudes; or live under the ſame parallel, and the ſame meridian, but in different ſemicircles of that meridian, or in oppoſite points of the parallel. Theſe have the ſame common ſeaſons throughout the year, and the ſame phænomena of the heavenly bodies; but when it is noon-day with the one, it is midnight with the other, there being twelve hours between them in an eaſt or weſt direction. Theſe are found on the globe, by the hour-index, or by turning the globe half round, that is 180 degrees either way. See the article GLOBE.

PERIOPHTHALMIUM. in natural hiſtory, the ſame with the nictitating membrane. See the article NICTITATING MEMBRANE.

PERIOSTEUM, or PERIOSTIUM, in anatomy, a nervous vaſculous membrane, endued with a very quick ſenſe, immediately ſurrounding, in every part, both the internal and external ſurfaces of all the bones in the body, excepting only ſo much of the teeth as ſtand above the gums, and the peculiar places on the bones, in which the muſcles are inſerted. It is hence divided into the external and internal perioſteum, and where it externally ſurrounds the bones of the ſkull, it is generally called the pericranium. See the article PERICRANIUM.

This membrane ſerves to conſtitute the firſt rudiments of the bones in a fœtus in utero. It is the organ of ſecretion for the bony matter, as the membrana adipoſa is for the fat: all the bones, during the time of their growth, receiving from it their matter of accretion, and afterwards their nutriment. The blood veſſels of the perioſteum penetrate in innumerable places into the bones themſelves, as is evidently ſeen in the freſh bones of children. The ſenſibility in the bones is wholly owing to this membrane; for when diveſted of this, they may be ſawed, cut, or burnt without pain. It gives the determination and figure to bones, as is evident from this, that when it is wounded, exoſtoſes, tophi, and caries ariſe in the part. The perioſteum is of different thickneſs in different parts, but in general the internal is vaſtly thinner than the external, and ſerves to nouriſh that part of the bones. It receives alſo nerves and blood-veſſels from the outſide, through certain canals in the ſubſtance of the bones, which it communicates to the marrow in ſuch as have any. It is generally ſaid to ariſe from the dura mater of the brain; but Heiſter thinks this opinion ſcarce right, as the perioſteum is evidently formed at the ſame time with the dura mater in the fœtus.

PERIPATETIC PHILOSOPHY, that ſyſtem taught and eſtabliſhed by Ariſtotle, and maintained by his followers, the peripatetics, called alſo ariſtotelians.

The greateſt and beſt part of Ariſtotle's philoſophy, he is ſaid to have borrowed from his maſter Plato. Serranus affirms confidently, and ſays that he is able to demonſtrate it, that there is nothing exquiſite in any part of Ariſtotle's philoſophy, dialectics, ethics, politics, phyſics, or metaphyſics, but is found in Plato: and of this opinion are many of the antient authors, Clemens Alexandrinus, *&c.* Ariſtotle's philoſophy preſerved itſelf *in puris naturalibus*, a long time, none of his followers or commentators having dared to make any innovation therein, till the beginning of the XIIIth century, when it began to be new modelled. A reformed ſyſtem of peripateticiſm was firſt introduced into the ſchools in the univerſity of Paris, from whence it ſoon ſpread throughout Europe, and has ſubſiſted in the univerſities to this day, under the name of ſchool philoſophy; the foundation whereof is Ariſtotle's doctrine frequently miſunderſtood, and often miſapplied: but of theſe, at different times, have ſprung ſeveral branches, as the thomiſts, ſcotiſts, nominaliſts, *&c.* See the article THOMISTS, *&c.*

PERIPETIA, περιπετεια, in the drama, that part of a tragedy, wherein the action is turned, the plot unravelled, and the whole concludes. See the article CATASTROPHE.

The qualities of the peripetia are, that it be

be probable and neceſſary; in order to which it muſt be the natural reſult, at leaſt the effect of the foregoing action, or of the ſubject itſelf, and muſt not ſtart from any foreign or collateral cauſe. The peripetia is ſometimes induced by remembrance or diſcovery, and ſometimes without any diſcovery.

PERIPHERY, in geometry, the circumference of a circle, ellipſes, or any other regular curvilinear figure. See the article CIRCUMFERENCE, CIRCLE, &c.

PERIPHRASIS, in rhetoric, the ſame with circumlocution. See the article CIRCUMLOCUTION.

PERIPLOCA, CLIMBING DOG'S BANE, in botany, a genus of the pentandria-digynia claſs of plants, the corolla whereof conſiſts of a ſingle plane petal, divided into five oblong, linear, truncated, and emarginated ſegments; the fruit conſiſts of two large, oblong, ventricoſe follicles, each formed of a ſingle valve, and containing one cell: the ſeeds are numerous, imbricated, and coronated with down; the receptacle is longitudinal and capillary.

PERIPNEUMONY, in medicine, an inflammation of the lungs attended with a weight in the lungs, a difficulty of breathing, and an oppreſſion of the breaſt, with a purulent ſpitting, and a fever accompanied with a cough. When the inflammation affects both the lobes, and the whole body of the lungs, the caſe is deſperate.

The peripneumony is diſtinguiſhed into two kinds; one of which has its ſeat at the extremity of the pulmonary artery, and is called the true peripneumony; and the other is ſituated in the bronchial arteries, and is called the ſpurious or baſtard peripneumony.

The true peripneumony is often cured by a critical reſolution and concoction of the morbific matter, which is either attenuated, ſo as to be returned into the channels in the common courſe of circulation, or expectorated by coughing; which may be eaſily known by an abatement of the ſymptoms, and the patient's falling into gentle breathing ſweats.

Copious bleeding is the moſt effectual remedy in the beginning of this diſeaſe; but not ſo proper when expectoration goes on ſucceſsfully, becauſe it ſometimes ſuppreſſes it, and in that caſe ſudorifics thicken the matter which is expectorated. The motions of nature ought to be followed; the aliment ought to be more ſlender and thin than in any other inflammatory diſeaſe whatſoever; common whey is ſufficient to preſerve the ſtrength of the patient; relaxing aliments are proper, of which barley, and all its preparations, are the beſt. Diuretics that have not much acrimony are uſeful; and for this intention, an infuſion of fennel-roots in warm water, with milk, is good. If nature relieves by a diarrhœa, without ſinking the ſtrength of the patient, it ought to be promoted by emollient clyſters. But if the patient is neither relieved nor dies in eight days, the inflammation will end in a ſuppuration, and an abſceſs of the lungs, and ſometimes in ſome other part of the body: in this caſe bleeding muſt be forborne; the diet muſt be mild, ſoft, incraſſating, and more plentiful; and tepid vapours ſhould be taken into the lungs, from decoctions of proper ingredients. When, by the ſymptoms and time, the impoſthume may be judged to be ripe, the vapour of vinegar, and any thing that creates a cough, are proper; for the ſooner it is broke, the leſs danger will the lungs be in. In this ſtate, which is not abſolutely deſperate, the aliment ought to be milk, and the drink milk and barley-water with gentle anodynes, that the patient may have ſome reſt.

Spurious, or *Baſtard* PERIPNEUMONY, a diſeaſe of the lungs, which generally ariſes from a heavy pituitous matter generated in the blood, and caſt upon the lungs. In this diſorder the patient is hot and cold by turns, is giddy upon the leaſt motion, and complains of a rending pain of the head whenever he coughs; he vomits up every thing that he drinks; the urine is turbid and red, and the whole thorax full of pain. In this diſorder the patient ſhould be let blood from a large orifice; and then give him the following clyſter, which muſt be repeated daily, till the ſymptoms evince that the lungs are relieved: take of honey, three ounces; of nitre, one dram; one yolk of an egg; and eight ounces of barley-water; make them into a clyſter. Let the patient's diet be very ſlender, ſuch as weak broths, ſharpened a little with orange or lemon-juice; and he may drink a weak mixture of honey and water: the ſteams of warm water may be taken in at the mouth, and the following decoction given him: take of the roots of fennel, two ounces; of the roots of graſs, four ounces; of the leaves of pellitory,

and agrimony, each an handful and a half; of the bruiſed ſeeds of white poppy, one ounce; and of liquorice, one ounce and an half; boil them, for a quarter of an hour, in two pints and a half of water: of which let the patient drink two ounces every two hours. Likewiſe let his legs and feet be bathed, and large bliſters applied.

PERIPTERE, in the antient architecture, a building encompaſſed on the outſide with a ſeries of inſulated columns, forming a kind of portico all around; ſuch were the portico of Pompey, the ſeptizon of Severus, and the baſilica of Antoninus.

The peripteres were properly temples, which had columns on all the four ſides, by which they were diſtinguiſhed from the proſtyle and amphiproſtyle, the laſt of which had no columns before, and the firſt none on the ſides.

M. Perault obſerves, that periptere, in the general ſenſe of the word, is the name of a genus, including all the ſpecies of temples, which have porticos of columns all around, whether the columns be diptere, or pſeudo-diptere, or ſimply periptere, which is a ſpecies that bears the name of a genus, and which has its columns diſtant from the wall, the breadth of an intercolumnation.

PERISCII, in geography, the inhabitants of either frigid zone, between the polar circles and the poles; where the ſun, when in the ſummer ſigns, moves only round about them, without ſetting, and conſequently their ſhadows, in the ſame day, turn to all the points of the horizon.

PERISKYTISM, in antient ſurgery, an inciſion made under the coronal ſuture, reaching from one temple acroſs to the other, penetrating to the bone of the cranium.

PERISTALTIC, in medicine, a vermicular ſpontaneous motion of the inteſtines, performed by the contraction of the circular and longitudinal fibres, of which the fleſhy coats of the inteſtines is compoſed; by means whereof the chyle is driven into the orifices of the lacteal veins, and the fæces are protruded towards the anus. See CHYLIFICATION.

When this motion comes to be depraved, and its direction changed, ſo as to proceed from below upwards, it produces what is called the iliac paſſion. See the article ILIAC PASSION.

PERISTAPHYLINUS, in anatomy, a name which ſome give to a muſcle of the uvula, more properly denominated pterygoſtaphylinus. See the articles UVULA and PTERYGOIDÆUS.

PERISTYLE, in antient architecture, a building encompaſſed with a row of columns on the inſide: ſuch was the hypæthre temple of Vitruvius, and ſuch are now ſome baſilicas in Rome, ſeveral palaces in Italy, and moſt cloiſters of religious.

Periſtyle is alſo uſed by modern writers, for a range of columns, either within or without a building: thus we ſay, the corinthian periſtyle of the portal of the Louvre, &c.

PERISYSTOLE, in medicine, the interval of reſt between the two motions of the heart, *viz.* that of the ſyſtole, or contraction, and that of the diaſtole, or dilatation.

PERITONÆUM, in anatomy, is a thin, ſmooth, and lubricous membrane, inveſting the whole internal ſurface of the abdomen, and containing moſt of the viſcera of that part, as it were in a bag. It lies immediately under the tranſverſe muſcles of the abdomen, and adheres to them, and alſo coheres with the diaphragm, and with all the viſcera lodged in this part. It entirely incloſes the ſtomach, the inteſtines, the meſentery, the omentum, the liver, the ſpleen, and the pancreas: as to the kidneys, ureters, and ſmaller veſſels of the abdomen, it covers them only on the anterior part, and the urinary bladder only on the poſterior. The peritonæum is compoſed of a double membrane, or lamella; the exterior one has longitudinal and ſlender fibres, and the interior tranſverſe and more robuſt ones. There are alſo ligaments formed from it, *viz.* that which ſuſpends the liver, and the two ligamenta lata of the uterus in women. Its proceſſes, ſent out of the abdomen, are two, and theſe ſerve to ſurround and incloſe the ſpermatic veſſels and the teſticles.

The arteries and veins of the peritonæum are ſupplied from the epigaſtric, mammary, lumbar, and diaphragmatic veſſels; and the nerves are propagated from thoſe of the diaphragm, back, loins, and os ſacrum.

The uſe of the peritonæum are, 1. To incloſe the contents of the abdomen; for when this part is dilated, wounded, or broken, they fall out of their due places, and ruptures are formed. 2. To give an external covering to almoſt all the parts

parts contained in the abdomen, which are therefore generally ſaid to have their external membrane from the peritonæum. And, 3. To form the proceſs of the peritonæum, and the tunica vaginalis of the teſtes.

PERITROCHIUM, in mechanics, denotes a wheel, or circle, concentric with the baſe of a cylinder, and moveable together with it, about an axis. See the article AXIS IN PERITROCHIO.

PERJURY, in law, the crime of ſwearing falſely, where a lawful oath is adminiſtered by one in authority, in a matter relating to the iſſue or cauſe in queſtion, whether it be a perſon's own wilful act, or done by the ſubornation of others. See OATH and SUBORNATION.

In order to make an offence perjury, it muſt appear to be wilful and deliberate, and not done through ſurprize or inadvertency: it muſt be direct and poſitive, and not where a perſon ſwears as he thinks or believes: but in caſe a perſon ſwears to what he is ignorant of, it is a falſe oath, even though what he ſwears ſhould happen to be true; thus, a plaintiff cauſed two perſons to ſwear to the value of goods, which they never ſaw, when, notwithſtanding they ſwore what was true, it was adjudged to be perjury in them. At the common law, perjury, and the ſubornation of it, are puniſhable by fine, impriſonment, pillory, tranſportation, &c. Perſons committing perjury in a cauſe concerning lands, goods, &c. depending in a court of record, ſhall forfeit 20 l. be impriſoned for ſix months, and be rendered incapable of giving evidence in any court, till the judgment is reverſed; and if offenders have not goods to the value of the fine, they are to be ſet in the pillory, in ſome market-place, and have their ears nailed thereto. When a perſon ſuborns a witneſs to give falſe teſtimony in a court of record, he forfeits 40 l. and if he be not worth ſo much, ſhall ſuffer ſix months impriſonment, and ſtand in the pillory, &c.

PERIWINKLE, in the hiſtory of ſhell-fiſh, a ſpecies of buccinum. See the article BUCCINUM.

PERMANENT, in general, ſomething that continues the ſame, whether in nature or ſituation, and other circumſtances: thus, air generated by fermentation, is ſaid to be permanent, becauſe it continues to ſhew all the natural properties of common air. See AIR.

Thus alſo thoſe cups of flowers are called permanent, which remain after the flower-leaves are fallen.

PERMEABLE, a term applied to bodies of ſo looſe and porous a ſtructure, as to let ſomething paſs through them.

PERMIA, a province on the north-eaſt part of european Muſcovy, ſeparated from Aſia by the river Oby.

PERMUTATION, in commerce, the ſame with bartering. See BARTERING.

In the canon-law, permutation denotes the actual exchange of one benefice for another.

PERMUTATION *of quantities*, in algebra, the ſame with combination. See the article COMBINATION.

PERNAMBUCO, a province of Braſil, in America, bounded by the province of Tamera on the north, by the Atlantic ocean on the eaſt, by the province of Seregippa on the ſouth, and by the country of the Tapuyers on the weſt; being two hundred miles long, and one hundred and fifty broad.

PERNANCY, in law, ſignifying taking or receiving, is peculiarly applied to tithes taken in kind. See PERNOR.

PERNES, a town of the french Netherlands, of the province of Artois, ſituated fifteen miles ſouth-eaſt of St. Omers.

PERNIONES, CHILBLAINS, or KIBES, in ſurgery, a name given to thoſe tumours, which happen in the hands and feet from violent cold. See the article COLD.

Chilblains are accompanied with inflammation, heat, redneſs, pricking pain, and immobility of that limb: ſometimes they are of a livid or leaden colour, and ſometimes they break out with ſcabs, or elſe with chops, or ſlits, which afterwards penetrate deeper, and become ulcerous. The humour which they diſcharge is a little fœtid, and pretty much reſembles pus or ſanies; and they terminate in either diſperſion, ſuppuration, or gangrene and ſphacelus. See the article DISPERSION, &c.

While the chilblains are yet tumified and red, and the part retains its ſenſe and motion, without any great heat and pain, the diſorder is then of the mildeſt kind; on the contrary, when they are livid, occaſion the limb to become ſtiff and inſenſible, or excite pricking pains therein, there is then danger of a worſe conſequence, leſt it ſhould degenerate into a gangrene, or at leaſt a deep exulceration. There being no room to doubt but that cold is the cauſe of chilblains, it readily follows that the cure muſt conſiſt chiefly

in

in reſtoring the blood to its former fluidity and free circulation as ſoon as poſſible; for which purpoſe an external as well as internal treatment is neceſſary. In the external treatment, the patient being expoſed in a temperate air, ſhould according to Heiſter, exerciſe his limbs as much as poſſible, in order to advance him ſtill to a greater warmth or heat; but when he is too weak to exerciſe himſelf, it will be proper to bath the parts affected with ſnow, or cold water; after which, when the limb becomes ſenſible, comfortable medicines may be applied, ſuch as ſpirit of wine, either pure, or with theriaca, rock-oil, balſam of ſulphur, *&c.* When the parts affected have been well rubbed or bathed with theſe, the patient may then be advanced towards the fire, or be put to bed, endeavouring afterwards to excite a gentle ſweat.

In the internal treatment, great ſervice will be had from a few glaſſes of hot wine, wherein has been boiled ſome cinnamon and ſugar; though it may not be improper to give with this alternately, a ſmall quantity of ſome ſudorific mixture. If the wine be not at hand, good ale boiled with cinnamon, cloves, and ſugar, may well enough ſupply its place. It ſhould be continued ſo as to keep up a ſweat for a whole hour, for half an hour, or according to the ſeveral circumſtances: but if the diſorder is much ſlighter, this method is not then ſo directly neceſſary; it may then be laid aſide: though, in the opinion of Heiſter, it is much preferable to any other method. When chilblains tend to a ſuppuration, then it is proper to treat them like other abſceſſes. See the article ABSCESS.

If a patient has before been troubled with chilblains, which are uſed to return every year in the winter, the preſervative againſt the diſorder is to anoint the parts affected with petroleum, or oil of turpentine, before and after the ſeverity of the winter comes on; but when the diſorder has begun to ſhew itſelf again by tumour, inflammation, and pain, the heel or finger may be wrapped up in a ſwine's bladder, dipped in the forementioned oil, and the cold itſelf ſhould always be carefully avoided by proper cloths or coverings.

PERNOR *of profits*, in law, he who takes the profits of lands, *&c.* and on ſeiſure, the king ſhall have the lands of an outlawed perſon, and the profits thereof, notwithſtanding they are aliened by the outlaw.

PERONE, in anatomy, the ſame with fibula. See FIBULA. Hence,

PERONÆUS, in anatomy, is an epithet applied to ſome of the muſcles of the perone or fibula. 1. The peronæus anticus, is a muſcle that ariſes at the anterior part of the middle of the fibula, and terminates at the exterior metatarſal bone; the office of this muſcle is to draw the foot upwards. 2. Peronæus poſticus is a muſcle that ariſes at the upper part of the fibula, but its tendon is turned back under the tarſus, and is inſerted into that bone of the metatarſus, which ſupports the great toe. There is uſually in old ſubjects a ſeſamoide bone in the tendon of this muſcle, where it paſſes under the os cuboides. Its office is alſo to pull the foot upwards. See MUSCLE.

PERONNE, a city of France, in the province of Picardy, ſituated on the river Somme, twenty-three miles north eaſt of Amiens.

PERORATION, *peroratio*, in rhetoric, the epilogue, or laſt part of an oration, wherein what the orator had inſiſted on through his whole diſcourſe, is urged afreſh with greater vehemence and paſſion. The peroration conſiſts of two parts. 1. Recapitulation, wherein the ſubſtance of what was diffuſed throughout the whole ſpeech is collected briefly, and curſorily, and ſummed up with new force and weight. 2. The moving the paſſions, which is ſo peculiar to the peroration, that the maſters of the art call this part ſedes affectuum. The paſſions to be raiſed are various, according to the various kinds of oration. In a panegyric, love, admiration, emulation, joy, *&c.* In an invective, hatred, contempt, *&c.* In a deliberation, hope, confidence, or fear. The qualities required in the peroration are, that it be very vehement and paſſionate, and that it be ſhort; becauſe, as Cicero obſerves, tears ſoon dry up.

PEROUSA, a town of Italy, in the province of Piedmont, capital of one of the vallies of the Vaudois, ſituated twelve miles ſouth-weſt of Turin.

PERPENDICULAR, in geometry, a line falling directly on another line, ſo as to make equal angles, on each ſide; called alſo a normal line: thus the line AB, plate CXCVII. fig. 2. n° 1. is perpendicular to the line CD. *i. e.* it makes right

right angles therewith. See ANGLE.

From the very notion of a perpendicular it follows; 1. That the perpendicularity is mutual, *i. e.* if a line, as AB, be perpendicular to another CD, that other is alſo perpendicular to the firſt. 2. That only one perpendicular can be drawn from one point in the ſame place. 3. That if a perpendicular be continued through the line it was drawn perpendicularly to, the continuation will alſo be perpendicular to the ſame. 4. That if there be two points of a right line, each of which is at an equal diſtance from two points of another right line, that line is perpendicular to the other. 5. That line which is perpendicular to another is alſo perpendicular to all the parallels of the other. 6. That a perpendicular line is the ſhorteſt of all thoſe which can be drawn from the ſame point to the ſame right line.

Hence, the ſhorteſt diſtance of a point from a line is a right line drawn from the point perpendicular to the line, or plane; and hence the altitude of a figure is a perpendicular let fall from the vertex to the baſe.

To raiſe, from the point A, (*ibid.* n° 2.) a line perpendicular to the line BC; make AB=AC and from the points B and C as centers, with the ſame opening of the compaſſes, deſcribe two arches cutting each other in the point D, and the line DA ſhall be the perpendicular required; that is, the angles DAB, DAC, ſhall be equal; becauſe all the ſides of the triangle DAB will be equal to all the ſides of the triangle DAC.

To let fall a perpendicular upon a line BC (*ib.* n° 3.) from a point given without it A; on the point A deſcribe an arch which ſhall cut the line in the points B and C: then making the equilateral triangle BEC (by prop. 1. lib. i. of Euclid) the line AE ſhall be perpendicular to the line BC. For ſince the triangles ABD and ACD have the ſide AD common, and AB is equal to AC, and the angle BAD is equal to the angle CAD, they are equal in every reſpect by prop. 4. lib. 1. of Euclid; and the angle D equal on each ſide: therefore by the definition the line AD is perpendicular to the line BC.

To erect a perpendicular on the end of a given line, ſuppoſe at R, (*ibid.* n° 4.) open your compaſſes to any convenient diſtance; and ſetting one foot in C, draw the ſemi-circle PRS. Lay a ruler from S thro' C, and it will find the point P in the circumference: whence draw PR, which is the perpendicular required. For the angle PRS being in a ſemi-circle muſt be a right one by prop. 31. lib. iii. of Euclid, and conſequently PR muſt be perpendicular to SR.

A line is ſaid to be perpendicular to a plane when it is perpendicular to more than two lines drawn in that plane; and a plane is ſaid to be perpendicular to another plane, when a line in one plane is perpendicular to the other plane.

PERPENDICULAR *to a parabola* is a right line cutting the parabola in the point in which any other right line touches it, and is alſo itſelf perpendicular to that tangent.

PERPENDICULARITY *of plants*, in natural hiſtory, a quality obſerved in all plants, which though they riſe a little crooked, yet the ſtems ſhoot up, and the roots ſink down, as much as poſſible in a perpendicular direction. This curious phænomenon was firſt obſerved by M. Dodart, who publiſhed an expreſs eſſay on the affectation of perpendicularity obſerved in the ſtems or ſtalks of all plants, in the roots of many, and even in their branches. He obſerves, that ſuch plants, or parts of plants, as by the declivity of the ſoil come out inclined, or ſuch as are diverted out of the perpendicular by any violent means, again redreſs and ſtraighten themſelves, and recover their perpendicularity by making a ſecond or contrary bend or elbow without rectifying the firſt.

PERPETUAL, ſomething that endures always, or laſts for ever.

It is ſometimes alſo uſed for a thing that laſts or holds during a perſon's life: thus offices, *&c.* held durante vita, are ſometimes called perpetual offices.

PERPETUAL GLANDS, in anatomy, are thoſe which are natural, thus diſtinguiſhed from the adventitious ones.

PERPETUAL MOTION, or MOVEMENT. See the article MOVEMENT.

PERPETUAL OCCULTATION. See the articles OCCULTATION.

PERPETUITY, in law, is when an eſtate is intended to be ſo ſettled in tail, *&c.* that it may not poſſibly be undone, or made void.

This is a thing the law will not ſuffer, on which account all perpetuities are avoided: for example, an eſtate cannot be made to deprive a tenant in tail, either by condition or limitation, of the power of

of alienation by fine and recovery, &c. and a term for years may not be deviſed to one and the heirs of his body, as an eſtate-tail with remainders over, to create a perpetuity, though it may be aſſigned to truſtees for the iſſue in tail to receive the profits, &c.

Perpetuity, in the canon law, is the quality of a benefice that is irrevocable, or whoſe incumbent cannot be deprived; except in certain caſes, determined by law.

PERPIGNAN, a city of Spain, in the province of Catalonia, capital of the territory of Rouſſillon, ſituated on the river Latet, in eaſt long. 2° 35′, north lat. 43°.

PER QUÆ SERVITIA, a judicial writ, which iſſues on the note of a fine, and lies for the cogniſee of a manor, lands, rents, or other ſervices, to compel the tenants thereof at the time of the fine levied to attorn to him. See COGNISEE.

PERQUISITE, in law, is any thing gotten by a man's own induſtry, or purchaſed with his money; in contradiſtinction to what deſcends to him, from his father or other anceſtor.

PERQUISITES *of courts*, are the profits which caſually accrue to a lord of the manor from his courts-baron, by fines for copyholds, eſcheats, heriots, amercements, &c.

PERRIWIG, or PERRUKE. See the article PERRUKE.

PERRON, in architecture, the ſteps in the front of a building, raiſed before the doors of great houſes, and leading to the firſt ſtory, when raiſed above the level of the ground.

Perrons are made of different forms and ſizes according to the ſpace and height they are to lead to: ſometimes the ſteps are round, or oval, but more uſually they are ſquare. Where a perron is thirteen or fifteen ſteps high, their range ought to be interrupted by one or two landing places, that there may not be too many ſteps to mount ſucceſſively, and that the eye may not be diſpleaſed by viewing ſo great a height without reſts. A perron ſhould always be confined to the height of the zocle, or foot of the whole building.

PERROQUET, or PARROQUET. See the article PARROQUET.

PERRUKE, or PERRIWIG, was antiently uſed for a head of long natural hair, particularly ſuch as was curled and adjuſted with great care. But it is now uſed for a ſet of borrowed hair, curled, baked, interwoven between four threads, and ſewed together on a cawl.

It is doubted whether the uſe of perrukes was known among the antients. It is true, they uſed falſe hair; but this ſeems to have had ſcarce any thing in common with our perrukes, and was at beſt only compoſed of hair glued together. Nothing can be more ridiculous than the deſcription Lampridius gives of the emperor Commodus's perruke, which was greaſed with glutinous perfumes, and powdered with ſcrapings of gold. In reality, the uſe of perrukes, at leaſt on their preſent footing, is not much above a hundred years old: the year 1629, is reckoned the epocha of long perrukes; at which time they began to appear at Paris, from whence they ſpread by degrees through the reſt of Europe.

PERRY, a drink made of pears, in the ſame manner as cyder is made from apples. See the article CYDER.

The pears muſt be perfectly ripe, and to give the liquor a greater degree of tartneſs, ſome mix crabs with them. The beſt fruit for making perry, is ſuch as is leaſt fit for eating, as the choak-pear, boreland-pear, horſe-pear, and the barbery-pear.

PER SE, in the ſchools, is ſometimes oppoſed to per accidens; in which ſenſe, a thing is ſaid to agree with another per ſe, when the agreement is not owing to any accidental event, but is found in the intrinſic principles of things themſelves. It is ſometimes oppoſed to per aliud; in which ſenſe, God alone is ſaid to have a being per ſe, as not deriving it from any other, but having it neceſſarily and of himſelf. Per ſe again ſignifies as much as of its own nature, or by virtue of its own entity: thus, the ſun is ſaid to give light per ſe, and thus quantity is extended per ſe.

Among logicians a thing is ſaid to be known per ſe, *per ſe notum*, when we immediately perceive it upon the firſt propoſing of the terms, as that the whole is greater than any one of its parts. Philoſophers go ſo far as to conſider the mode of a thing exiſting per ſe, or that which conſtitutes its exiſtence ſuch, which they call perſeity, or perſeitas.

Among chemiſts, when a body is diſtilled ſingly, and without the uſual addition of any other matter to raiſe it, it is ſaid to be diſtilled per ſe.

PERSECUTION, is any pain or affliction which

which a perſon deſignedly inflicts upon another; and, in a more reſtrained ſenſe, the ſufferings of chriſtians on account of their religion.

Hiſtorians uſually reckon ten general perſecutions, the firſt of which was under the emperor Nero, thirty one years after our lord's aſcenſion; when that emperor having ſet fire to the city of Rome, threw the odium of that execrable action on the chriſtians, who under that pretence were wrapped up in the ſkins of wild beaſts, and worried and devoured by dogs; others were crucified, and others burnt alive. The ſecond was under Domitian, in the year 95. In this perſecution St. John the apoſtle was ſent to the iſle of Patmos, in order to be employed in digging in the mines. The third began in the third year of Trajan, in the year 100, and was carried on with great violence for ſeveral years. The fourth was under Antoninus the philoſopher, when the chriſtians were baniſhed from their houſes, forbidden to ſhew their heads, reproached, beaten, hurried, from place to place, plundered, impriſoned and ſtoned. The fifth, began in the year 197, under the emperor Severus. The ſixth, began with the reign of the emperor Maximinus in 235. The ſeventh, which was the moſt dreadful perſecution that had ever been known in the church, began in the year 250, in the reign of the emperor Decius, when the chriſtians were in all places driven from their habitations, ſtripped of their eſtates, tormented with racks, &c. The eighth began in the year 257, in the fourth year of the reign of the emperor Valerian. The ninth was under the emperor Aurelian A. D. 274, but this was very inconſiderable: and the tenth began in the nineteenth year of Dioclefian, A. D. 303. In this dreadful perſecution, which laſted ten years, houſes filled with chriſtians were ſet on fire, and whole droves were tied together with ropes, and thrown into the ſea.

PERSEES, the ſame with gaurs. See the article GAURS.

PERSEPOLIS, formerly a city of Perſia, but now in ruins. Here are the moſt magnificent remains of a palace, or temple, that are now in being on the face of the earth: eaſt long. 54°, north lat. 30° 30′.

PERSEVERANCE, in theology, a chriſtian virtue, by which we are enabled to perſiſt in the way of ſalvation to the end. The final perſeverance of the ſaints is a doctrine much controverted between the arminians and calviniſts; the latter of whom maintain, that it is impoſſible for grace to be loſt, and conſequently make perſeverance to the end a neceſſary conſequence thereof; while the others imagine, that the moſt confirmed believers are never out of a poſſibility of falling.

PERSEUS, in aſtronomy, a conſtellation of the northern hemiſphere, which, according to the catalogues of Ptolemy and Tycho, contains twenty-nine ſtars; but in the britannic catalogue, ſixty-ſeven.

PERSHORE, a market-town of Worceſterſhire, ten miles ſouth-eaſt of Worceſter.

PERSIA, a large kingdom of Aſia, 1200 miles long, and almoſt as much broad; ſituated between 45° and 67° of eaſt longitude, and between 25° and 45° of north latitude; bounded by Circaſſian Tartary the Caſpian Sea, and the river Oxus on the north; by Indian, on the eaſt; by the Indian Ocean, and the gulphs of Ormus and Perſia, on the ſouth; and by the turkiſh empire on the weſt.

PERSIAN, in general, ſomething belonging to Perſia, as the Perſian empire, language, &c.

The perſian tongue has two peculiarities not to be met with in any other of the eaſtern languages; the one, that it has an auxiliary verb anſwering to the verb εἰμὶ of the greeks; the other, that it has an aoriſtus. Theſe peculiarities it borrowed from the Macedonians, after the conqueſt of Alexander.

PERSIAN-WHEEL, an engine, or wheel, turned by a rivulet, or other ſtream of water, and fitted with open boxes at its cogs, to raiſe water for the overflowing of lands, or other purpoſes. See the article OVERFLOWING.

It may be made of any ſize, according to the height the water is to be raiſed to, and the ſtrength of the ſtream by which it is turned. This wheel is placed ſo, that its bottom only is immerſed in the ſtream, wherein the open boxes at its cogs are all filled one after another with water, which is raiſed with them to the upper part of the wheel's circuit, and then naturally empties itſelf into a trough which carries it to the land.

PERSICA, the PEACH, is only a ſpecies of the amygdalus, or almond-tree. See the article AMYGDALUS.

The ſerratures of its leaves are acute;

the flowers are of a pale red; and the fruit is large and ſucculent, and contains a large ſtone. See plate CC. fig. 1. It is a native of Perſia, whence it got the name of malus perſica: a ſyrup of its flowers is a gentle emetic.

PERSICARIA, ARSMART, in botany, a genus of the octandria trigynia claſs of plants, with a monopetalous flower, divided into five oval ſegments, alternately patent and connivent: there is no pericarpium, the ſeed, which is ſingle, and of an oval compreſſed figure, being contained in the flower-petal, which is permanent.

There is great irregularity in this genus; there being in this ſpecies only five ſtamina; and in others ſix, or eight.

The mild or ſpotted arſmart is ſaid to be a good vulnerary and antepileptic: and the biting arſmart is a good ſtimulating medicine, and diuretic: its freſh leaves are alſo uſed by farriers for cleanſing old ulcers.

PERSON, an individual ſubſtance of a rational or intelligent nature. Thus we ſay, an embaſſador repreſents the perſon of his prince; and that in law, the father and ſon are reputed the ſame perſon.

In theology, the godhead is divided into three perſons; but here the word perſon is deſigned to convey a peculiar idea, very different from that attached to it every where elſe; it being only uſed for want of another term more pertinent and expreſſive. See TRINITY.

PERSON, in dramatic poetry, the character aſſumed by an actor, or he who is repreſented by the player. Thus, at the head of dramatic pieces, is placed the dramatis perſonæ, or liſt of the perſons that are to appear on the ſtage. Father Boſſu obſerves, that in the epic and dramatic poem the ſame perſon muſt reign throughout; that is, muſt ſuſtain the chief part through the whole piece, and the characters of all the other perſons muſt be ſubordinate to him. See the articles TRAGEDY, CHARACTER, &c.

PERSON, in grammar, a term applied to ſuch nouns or pronouns, as being either prefixed or underſtood, are the nominatives in all inflexions of a verb; or it is the agent or patient in all finite and perſonal verbs. See the article NOMINATIVE and VERB.

There are three perſons of a verb; as *I love*, is a verb uſed in the firſt perſon; *thou loveſt*, is the verb uſed in the ſecond perſon; and *he loveth*, makes the third perſon; and thus in the plural number: the dual number of the Greeks have the ſecond and third perſons dual, as, *ye two love*, *they two love*, &c. *I*, *thou*, *he*, are pronouns of the firſt ſecond, and third perſon ſingular. *We*, *ye*, *they*, of the firſt, ſecond, and third perſons plural. The firſt perſon is that which ſpeaks, the ſecond is that to whom the ſpeech is directed, and the third is that whom the diſcourſe concerns. In the latin and greek languages the perſon of a verb is no more than the different terminations of that verb in every tenſe.

PERSONABLE, in law, ſignifies the being able to maintain a plea in court; eſpecially in the plea of an alien, who may be made perſonable by act of parliament.

It is alſo uſed to ſignify a capacity to receive any thing granted or given.

PERSONAL, any thing that concerns, or is reſtrained to, the perſon: thus it is a maxim in ethics, that all faults are perſonal.

PERSONAL ACTION, in law, is an action levied directly and ſolely againſt the perſon; in oppoſition to a real or mixed action. See the article ACTION.

PERSONAL GOODS, or chattels, in law, ſignifies any moveable thing belonging to a perſon, whether alive or dead. See the article CHATTELS.

PERSONAL TYTHES, are tythes payable out of the profits obtained by a man's perſonal labour and induſtry, as in buying, ſelling, handicraft, &c.

PERSONAL VERB, in grammar, a verb conjugated in all the three perſons; thus called, in oppoſition to an imperſonal verb, or that which has the third perſon only. See the article IMPERSONAL VERB.

PERSONALITY, in the ſchools, that which conſtitutes an individual or diſtinct perſon.

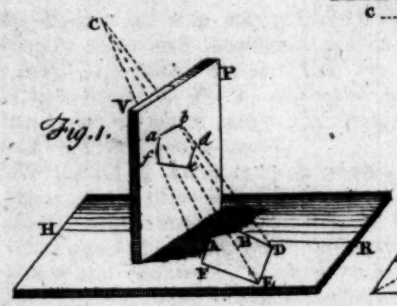
The ſchool-divines are divided about what it is, that diſtinguiſhes the ſeveral perſonalities in the Trinity; ſome will have it to be only the different relations, others contend for its being ſome incommunicable ſubſtance, and others take the perſonalities to be diſtinguiſhed by different origins. See TRINITY.

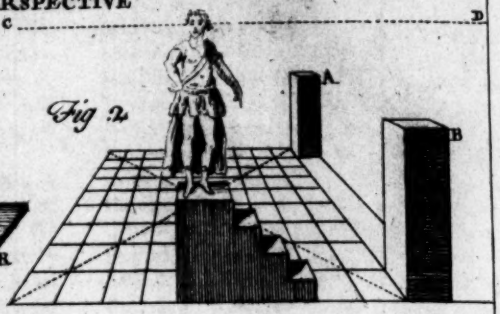
PERSONALITY, or PERSONALTY, in law, is ſometimes uſed for perſon: thus an action is ſaid to be in perſonality when it is brought againſt the right perſon.

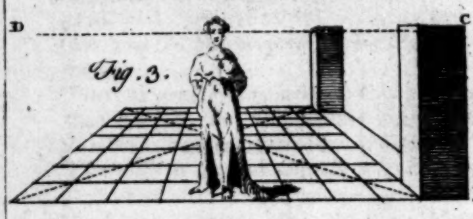
PERSONATED-FLOWERS, among botaniſts are flowers which reſemble the gaping

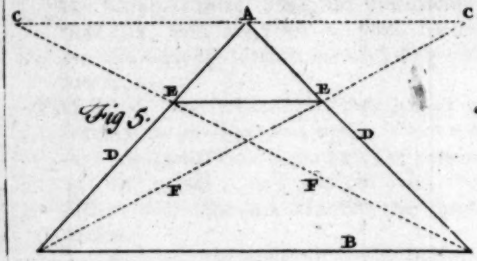
BRITISH MUSEUM

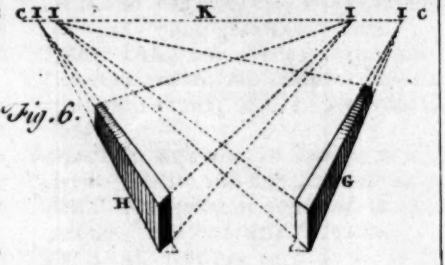
PERSPECTIVE

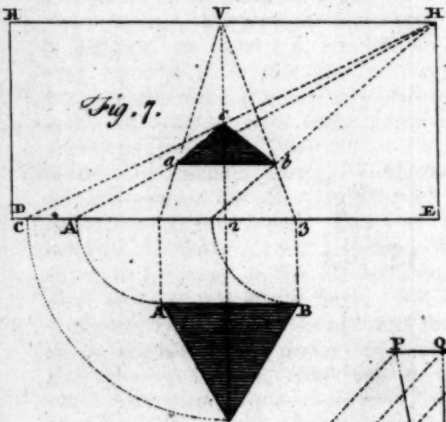


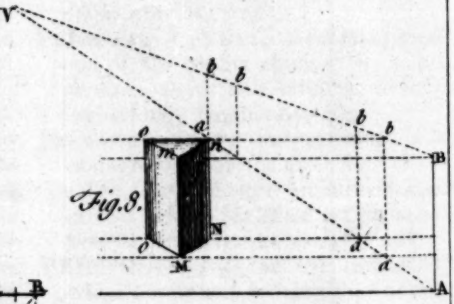












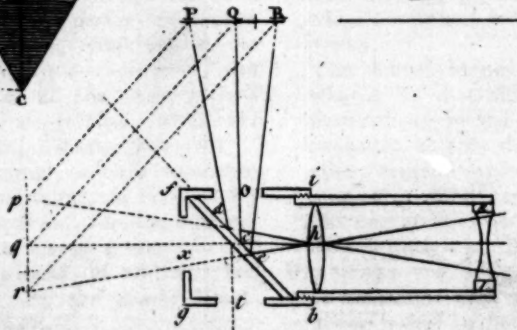


Fig. 9. A Reflecting PERSPECTIVE GLASS

S.

Sime sculpt.

gaping mouths of certain living creatures. See the article FLOWER.

PERSONIFYING, or PERSONALIZING, the giving an inanimate being the figure, ſentiments, and language of a perſon. Perſonifying is eſſential to poetry, eſpecially to the epopœia: the poets have therefore perſonifyed all the paſſions, and even repreſented them as deities; as the goddeſs Perſuaſion, the god Sleep; the Furies, Envy, Diſcord, and Fame, Fortune, Victory, Sin, Death, &c.

PERSPECTIVE, that branch of optics, which teaches how to repreſent objects on a plane ſuperficies, ſuch as they would appear at a certain diſtance and height, upon a tranſparent plane perpendicular to the horizon, placed between the objects and the eye.

The foundation of perſpective may be thus conceived: ſuppoſe the pentagon ABDEF (plate CXCVIII. fig. 1.) were to be repreſented by the rules of perſpective on the tranſparent plane V P, placed perpendicularly on the horizontal plane HR; dotted lines are imagined to paſs from the eye C to each point of the pentagon, as CA, CB, CD, &c. which are ſuppoſed in their paſſage through the plane P V, to leave their traces or veſtigia in the points *a*, *b*, *d*, &c. on the plane, and thereby to delineate the pentagon *a b d e f*; which, as it ſtrikes the eye by the ſame rays that the original pentagon A B D E F does, will be a true perſpective repreſentation of it.

The buſineſs of perſpective, therefore, is to lay down geometrical rules for finding the points *a*, *b*, *d*, *e*, *f*, upon the plane; and hence, alſo, we have a mechanical method of delineating any object very accurately. See DESIGNING.

Perſpective is either employed in repreſenting the ichnographies, or ground-plots of objects; or the ſcenographies, or repreſentations of the objects themſelves. See the article ICHNOGRAPHY and SCENOGRAPHY.

But before we give any examples of either, it will be proper to explain ſome technical terms in regard to perſpective in general: and, firſt, the horizontal line is that ſuppoſed to be drawn parallel to the horizon through the eye of the ſpectator; or rather it is a line which ſeparates the heaven from the earth, and which limits the ſight. Thus, A, B, (*ibid.* fig. 2.) are two pillars below the horizontal line, C D, by reaſon the line is elevated above them; in fig. 3. they are ſaid to be equal with it; and in fig. 4. raiſed above it. Thus, according to the different points in view, the objects will be either higher or lower than the horizontal line. The point of ſight, A (*ibid.* fig. 5.) is that which makes the centrical ray on the horizontal line, *a b*; or, it is the point where all the the other viſual rays, D, D, unite. The points of diſtance, C, C, are points ſet off in the horizontal line at equal diſtances on each ſide of the point of ſight, A; and, in the ſame figure, B B repreſents the baſe line, or fundamental line; E E is the abridgement of the ſquare, of which D, D, are the ſides; F, F, the diagonal lines, which go to the points, of diſtance C, C. Accidental points, are thoſe where the objects end: theſe may be caſt negligently, becauſe neither drawn to the point or ſight, nor to thoſe of diſtance, but meeting each other in the horizontal line. For example, two pieces of ſquare timber, G and H (*ibid.* fig. 6.) make the points I, I, I, I, on the horizontal line; but go not to the point of ſight K, nor to the points of diſtance C, C: theſe accidental points ſerve likewiſe for caſements, doors, windows, tables, chairs, &c. The point of direct view, or of the front, is when we have the object directly before us; in which caſe, it ſhews only the foreſide; and, if below the horizon, a little of the top; but nothing of the ſides, unleſs the object be polygonous. The point of oblique view, is when we ſee an object aſide of us, and as it were aſlant, or with the corner of the eye; the eye, however, being all the while oppoſite to the point of ſight; in which caſe, we ſee the object laterally, and it preſents to us two ſides or faces. The practice is the ſame in the ſide-points, as in the front-points; a point of ſight, points of diſtance, &c. being laid down in the one as well as in the other.

We ſhall now give ſome examples, by which it will appear, that the whole practice of perſpective is built upon the foundation already laid down. Thus, to find the perſpective appearance of a triangle, A B C (*ibid.* fig. 7.) between the eye and the triangle, draw the line D E, which is called the fundamental line; from 2 draw 2 V, repreſenting the perpendicular diſtance of the eye above the fundamental line, be it what it will; and through V draw, at right angles to 2 V, H K parallel to D E: then will

the plane D H K E repreſent the tranſparent plane, on which the perſpective repreſentation is to be made. Next to find the perſpective points of the angles of the triangle, let fall perpendiculars A 1, C 2, B 3 from the angles to the fundamental D E: ſet off theſe perpendiculars upon the fundamental oppoſite to the point of diſtance K, to B, A, C; from 1, 2, 3, draw lines to the principal point V; and from the points A, B, and C on the fundamental line, draw the right lines A K, B K, C K, to the point of diſtance K; which is ſo called, becauſe the ſpectator ought to be ſo far removed from the figure or painting, as it is diſtant from the principal point V. The points *a*, *b*, and *c*, where the viſual lines V 1, V 2, V 3 interſect the lines of diſtance A K, B K, C K, will be the angular points of the angle *a b c*, the true repreſentation of A B C.

By proceeding in this manner with the angular points of any right-lined figure, whether regular or irregular, it will be very eaſy to repreſent it in perſpective: however, in practice, ſeveral compendious methods will occur to every artiſt.

Again, if the ſcenographic appearance of any ſolid were to be repreſented; ſuppoſe of a triangular priſm, whoſe baſe is the triangle *m n o* (*ibid.* fig. 8.); you need only find the upper ſurface of it, in the ſame manner as you found the lower, or baſe; and then joining the correſponding points by right lines, you will have the true repreſentation of the ſolid in perſpective. So that the work is the ſame as before; only you take a new fundamental line, as much higher than the former, as in the altitude of that ſolid whoſe ſcenographic repreſentation you would delineate.

But there is ſtill a more commodious way, which is this: having found, as above, the baſe or ichnographic plane *m n o*, (*ibid.*) let perdendiculars be erected to the fundamental line from the three angular points, which will expreſs the altitude of thoſe points. But becauſe theſe altitudes, though equal in the body or ſolid itſelf, will appear unequal in the ſcenographic view, the fartheſt off appearing leſs than thoſe nearer the eye, their true proportional heights may be thus determined. Any where in the fundamental line, let A B be erected perpendicularly, and equal to the true altitude; or, if the figure has different altitudes, let them be transferred into the perpendicular A B; and from the points A and B, and from all the points of intermediate altitudes, if there be any ſuch, draw right lines to the point of ſight V: thoſe lines, A V, B V, will conſtitute a triangle with A B, within which all the points of altitude will be contained. Through the points *o*, *n*, *m*, draw parallels to the fundamental line; and from the points *a*, *a*, &c. erect perpendiculars to thoſe parallels; and the points where they interſect the lines A V, B V, as in *a*, *a*, *b*, *b*, &c. will determine the apparent height of the ſolid in that ſcenographic poſition to the eye in V.

In practice, theſe parallels and perpendiculars are eaſily drawn, by means of a good drawing-board or table, fitted for the purpoſe.

The practical part of perſpective, is only the application of theſe rules to the actual deſcription of objects. But, as this part is purely mathematical, its aſſiſtance towards drawing is only what can be performed by rule and compaſs, and can therefore ſtrictly ſerve only for finding the images of points, of which they are compoſed; and, as theſe are infinite, it is endleſs to find them all by the ſtrict rules; whence it becomes neceſſary, after a ſufficient number of them are found, to complete the image by the help of drawing, to the better effecting of which theſe points ſerve as a guide. Thus, when a circle is to be deſcribed, the practical rules ſerve to find a ſufficient number of points in the circumference; which being neatly joined by hand, will perfect the image, ſo that, in ſtrictneſs, nothing in this image is found by mathematical rules, ſave the few particular points; the reſt owes its being to the hand of the drawer.

Thus alſo, if any complicated figure be propoſed, it may not be eaſy to apply the practical rules to the deſcription of every minute part, but by incloſing that figure in a regular one, properly ſubdivided and reduced into perſpective, that will ſerve as a help, whereby a perſon, ſkilled in drawing, may with eaſe deſcribe the object propoſed: upon the whole, where the boundaries of the propoſed objects conſiſt of ſtraight lines, and plain ſurfaces, they may be deſcribed directly by the rules of perſpective; but when they are curvilinear, either in their ſides or ſurfaces, the practical rules can only ſerve for the deſcription of ſuch right-lined caſes as may conveniently incloſe the objects, and which will enable the deſigner

to

to draw them within thoſe known bounds, with a ſufficient degree of exactneſs.

It is therefore in vain to ſeek, by the practical rules of perſpective, to deſcribe all the little hollows and prominencies of objects, the different light and ſhade of their parts, or their ſmaller windings and turnings; the infinite variety of the folds in drapery; of the boughs and leaves of trees, or the features and limbs of men and animals; much leſs to give them that roundneſs and ſoftneſs, that force and ſpirit, that eaſineſs and freedom of poſture, that expreſſion and grace which are requiſite to a good picture: perſpective muſt content itſelf with its peculiar province of exhibiting a kind of rough draught to ſerve as a ground-work, and to aſcertain the general proportions and places of the objects, according to their ſuppoſed ſituations, leaving the reſt to be finiſhed, beautified, and ornamented by a hand ſkilful in drawing.

It is true, perſpective is of moſt uſe where it is moſt wanted, and where a deviation from its rules would be the moſt obſervable; as in deſcribing all regular figures, pieces of architecture, and other objects of that ſort, where the particular tendency of the ſeveral lines is moſt remarkable; the rule and compaſs, in ſuch caſes, being much more exact than any deſcription made by hand: but ſtill the figure, deſcribed by the perſpective rules, will need many helps from drawing; the capitals, and other ornaments of pillars, and their entablatures, the ſtrength of light and ſhade, the apparent roundneſs and protuberance of the ſeveral parts, muſt owe their beauty and finiſhing to the deſigner's hand: but, with regard to ſuch objects as have no conſtant and certain determinate ſhape or ſize, ſuch as clouds, hills, trees, rivers, uneven grounds, and the like, there is a much larger latitude allowable, provided the general bulk, or uſual natural ſhape of thoſe objects, be in ſome meaſure obſerved, ſo as not to make them appear unnatural or monſtrous. See the article DRAWING.

But, although the ſtrict practical rules of perſpective are in a great meaſure confined to the deſcription of right-lined figures, yet the knowledge of the general laws of that ſcience is of great and neceſſary uſe to inform the judgment, after what manner the images of any propoſed lines ſhould run, which way they ſhould tend, and where terminate; and thereby enables it the better to determine what appearance any object ought to put on, according to their different ſituations and diſtances: it accuſtoms the eye to judge, with greater certainty, of the relations between real objects and their perſpective deſcriptions, and the hand to draw the ſame accordingly, and directs the judgment readily to diſcover any conſiderable error therein, which might otherwiſe eſcape notice. Beſides that, when the ground, or general plan, and the principal parts of a picture are firſt laid down according to the rules, every thing elſe will more naturally fall in with them, and every remarkable deviation from the juſt rules will be the more readily perceived, and the eaſier avoided or rectified; ſo that although it may be infinitely tedious, or abſolutely impracticable, to deſcribe every minute part of a picture, by the ſtrict mechanical rules; yet the employing them, where they can be the moſt commodiouſly uſed, will give the picture in general ſuch a look, as will guide the artiſt in drawing the other parts without any obvious inconſiſtency.

We ſhall, therefore, give ſuch rules as are of moſt general uſe in the practice of perſpective. 1. Let every line, which in the object, or geometrical figure, is ſtraight, perpendicular or parallel to its baſe, be ſo alſo in its ſcenographic delineation. 2. Let the lines, which in the object return at right angles from the fore-right ſide, be drawn ſcenographically from the viſual point. 3. Let all ſtraight lines, which in the object return from the fore right ſide, run in a ſcenographic figure into the horizontal line. 4. Let the object you intend to delineate, ſtanding on your right-hand, be placed alſo on the right-hand of the viſual point; and that on the left-hand, on the left-hand of the ſame point; and that which is juſt before, in the middle of it. 5. Let thoſe lines which are (in the object) equidiſtant to the returning line be drawn in the ſcenographic figure, from that point found in the horizon. 6. In ſetting off the altitude of columns, pedeſtals, and the like, meaſure the height from the baſe line upwards, in the front or fore-right ſide; and a viſual ray down that point in the front ſhall limit the altitude of the column or pillar, all the way behind the fore-right ſide, or orthographic appearance, even to the viſual point. This rule you muſt obſerve in all figures, as well where there is a front or fore-

right

right ſide, as where there is none. 7. In delineating ovals, circles, arches, croſſes, ſpirals, and croſs-arches, or any other figure in the roof of any room, firſt draw ichnographically, and ſo with perpendiculars from the moſt eminent points thereof, carry it up unto the ceiling; from which ſeveral points, carry on the figure. 8. The center in any ſcenographic regular figure is found by drawing lines from oppoſite angles: for the point where the diagonals croſs, is the center. 9. A ground-plane of ſquares is alike, both above and below the horizontal line; only the more it is diſtant above or beneath the horizon, the ſquares will be ſo much the larger or wider. 10. In drawing a perſpective figure, where many lines come together, you may, for the directing of your eye, draw the diagonals in red; the viſual lines in black; the perpendiculars in green, or other different colour, from that which you intend the figure ſhall be of. 11. Having conſidered the height, diſtance, and poſition of the figure, and drawn it accordingly, with ſide or angle againſt the baſe; raiſe perpendiculars from the ſeveral angles, or deſigned points, from the figure to the baſe, and transfer the length of each perpendicular, from the place where it touches the baſe, to the baſe on the ſide oppoſite to the point of diſtance; ſo will the diametrals drawn to the perpendiculars in the baſe, by interſection with the diagonals, drawn to the ſeveral transferred diſtances, give the angles of the figures, and ſo lines drawn from point to point will circumſcribe the ſcenographic figure. 12. If in a landſkip there be any ſtanding-waters, as rivers, ponds, and the like, place the horizontal line level with the fartheſt ſight or appearance of it. 13. If there be any houſe, or the like, in the picture, conſider their poſition, that you may find from what point in the horizontal lines to draw the front and ſides thereof. 14. In deſcribing things at a great diſtance, obſerve the proportion, both in magnitude and diſtance, in draught, which appears from the object to the eye. 15. In colouring and ſhadowing of every thing, you muſt do the ſame in your picture, which you obſerve with your eye, eſpecially in objects lying near; but, according as the diſtance grows greater and greater, ſo the colours muſt be fainter and fainter, till at laſt they loſe themſelves in a darkiſh ſky-colour. 16. The catoptrics are beſt ſeen in a common looking-glaſs, or other poliſhed matter; where, if the glaſs be exactly flat, the object is exactly like its original; but, if the glaſs be not flat, the reſemblance alters from the original; and that more or leſs, according as the glaſs differs from an exact plane. 17. In drawing catoptric figures, the ſurface of the glaſs is to be conſidered, upon which you mean to have the reflection: for which you muſt make a particular ichnographical draught, or projection; which on the glaſs muſt appear to be a plane full of ſquares, on which projection transfer what ſhall be drawn on a plane, divided into the ſame number of like ſquares; where though the draught may appear very confuſed, yet the reflection of it on the glaſs will be very regular, proportional, and regularly compoſed. 18. The dioptric, or broken beam, may be ſeen in a tube through a cryſtal or glaſs, which hath its ſurface cut into many others, whereby the rays of the object are broken. For to the flat of the cryſtal, or water, the rays run ſtraight; but then they break and make an angle, which alſo by the refracted beams is made and continued on the other ſide of the ſame flat. 19. When theſe faces on a cryſtal are returned towards a plane placed directly before it, they ſeparate themſelves at a good diſtance on the plane; becauſe they are all directed to various far diſtant places of the ſame. See the articles REFLECTION and REFRACTION.

Aerial PERSPECTIVE, is the art of giving a due diminution or degradation to the ſtrength of the light, ſhade and colours of objects, according to their different diſtances, the quantity of light which falls on them, and the medium through which they are ſeen.

As the eye does not judge of the diſtance of objects entirely by their apparent ſize, but alſo by their ſtrength of colours, and diſtinction of parts; ſo it is not ſufficient to give an object its due apparent bulk according to the rules of ſtereography, unleſs at the ſame time it be expreſſed with that proper faintneſs and degradation of colour which the diſtance requires.

Thus if the figure of a man at a diſtance, were painted of a proper magnitude for the place, but with too great a diſtinction of parts, or too ſtrong colours, it would appear to ſtand forward, and ſeem proportionally leſs, ſo as to repreſent a dwarf

dwarf ſituated nearer the eye, and out of the plane on which the painter intended it ſhould ſtand.

By the original colour of an object is meant that colour which it exhibits to the eye when duly expoſed to it in a full open uniform light, at ſuch a moderate diſtance as to be clearly and diſtinctly ſeen. This colour receives an alteration from many cauſes, the principal of which are the following.

1. From the objects being removed to a greater diſtance from the eye, whereby the rays of light which it reflects, are leſs vivid, and the colour becomes more diluted, and tinged, in ſome meaſure, by the faint bluiſh caſt, or with the dimneſs or hazineſs of the body of air through which the rays paſs.

2. From the greater or leſs degree of light with which the object is enlightened; the ſame original colour having a different appearance in the ſhades, from what it has in the light, although at an equal diſtance from the eye, and ſo in proportion to the ſtrength of the light or ſhade.

3. From the colour of the light itſelf which falls upon it; whether it be from the reflection of coloured light from any adjacent object, or by its paſſage through a coloured medium; which will exhibit a colour compounded of the original colour of the object, and the other accidental colours which the light brings with it.

4. From the poſition of the ſurface of the object, or of its ſeveral parts with reſpect to the eye; ſuch parts of it appearing more lively and diſtinct than thoſe which are ſeen obliquely.

5. From the cloſeneſs or openneſs of the place where the object is ſituated; the light being much more variouſly directed and reflected within a room, than in the open air.

6. Some original colours naturally reflect light in a greater proportion than others, though equally expoſed to the ſame degrees of it; whereby their degradation at ſeveral diſtances will be different from that of other colours which reflect leſs light.

From theſe ſeveral cauſes it happens that the colours of objects are ſeldom ſeen pure and unmixed, but generally arrive at the eye broken and ſoftened by each other; and therefore, in painting, where the natural appearances of objects are to be deſcribed, all hard or ſharp colouring ſhould be carefully avoided.

A painter, therefore, who would ſucceed in aerial perſpective, ought carefully to ſtudy the effects which diſtance, or the different degrees of, or colours of light, have on each particular original colour, to know how its appearance or ſtrength is changed in the ſeveral circumſtances above mentioned, and repreſent it accordingly; ſo that in a picture of various coloured objects, he may be able to give each original colour its own proper diminution or degradation, according to its place.

Now, as all objects in a picture are proportioned to thoſe placed in the front; ſo in aerial perſpective, the ſtrength of light, and the brightneſs of the colours of objects cloſe to the picture, muſt ſerve as a ſtandard, with reſpect to which, all the ſame colours at different diſtances, muſt have a proportional degradation in like circumſtances.

In order, therefore, to give any colour its proper diminution in proportion to its diſtance, it ought to be known what the appearance of that colour would be, were it cloſe to the picture, regard being had to that degree of light which is choſen as the principal light of the picture. For if any colour ſhould be made too bright for another, or for the general colours imployed in the reſt of the picture, it will appear too glaring, ſeem to ſtart out of its place, and throw a flatneſs and damp upon the reſt of the work; or, as the painters expreſs it, the brightneſs of that colour will kill the reſt.

PERSPECTIVE alſo denotes a kind of painting frequently ſeen in gardens, at the ends of galleries, *&c.* expreſsly deſigned to deceive the ſight.

PERSPECTIVE-GLASS, in optics, differs from a teleſcope in this: inſtead of the convex eye-glaſs placed behind the image, to make the rays of each pencil go parallel to the eye, there is placed a concave eye-glaſs as much before it; which opens the converging rays, and makes them emerge parallel to the eye.

The quantity of objects taken in at one view with this inſtrument, does not depend upon the breadth of the eye-glaſs, as in the aſtronomical teleſcope, but upon the breadth of the pupil of the eye.

Reflecting perſpective-glaſſes, called by ſome opera-glaſſes, or diagonal perſpectives, are ſo contrived, that a perſon can view any one in a public place, as the opera or play-houſes, without it being poſſible to diſtinguiſh who it is he looks at.

at. A ſection of it is delineated in plate CXCVIII. fig. 9. where *k a l* is the eye-glaſs, *i b b* the object-glaſs, and *d c e* a little ſpeculum or reflecting plane, which is fixed obliquely in a ſhort tube *f g b i*, ſcrewed upon the end of the perſpective tube *b i k l*, ſo that its axis ſhall make about half a right angle with the ſpeculum. By this means, an object Q will be ſeen by the eye at *a*, in the returning ray Q *c b a*; ſo that the way to find an object, intended to be viewed by this inſtrument, is to direct its axis at a right angle to the rays that come from the object; and if the object be higher or lower, it may be found by turning the perſpective to and fro about its axis.

If the object be too near to be ſeen at the perſpective end *k a l*, turn the other to the eye; and by looking through the hole *x*, you will ſee the object S, by the ray S *t v x*; coming through the hole *t*, and reflected from another ſpeculum parallel to the former. If the ſpectator be ſhort-ſighted, a concave-glaſs muſt be placed in the hole *x*, otherwiſe a plane one, to make the inſtrument more like a common perſpective.

In both theſe caſes, the ſpeculum neither magnifies nor diminiſhes the appearance of the object; for if the axis *a c* be produced till *c q* = *c* Q, the reflected rays will diverge as from an image at *q* equal to the object at Q; with this difference only, that the right ſide of the object will appear on the left-hand, and the left ſide on the right.

PERSPECTIVE PLANE, is the glaſs, or other tranſparent ſurface, PV, (plate CXCVIII. fig. 1.) ſuppoſed to be placed between the eye and the object, perpendicular to the horizon. It is ſometimes called the ſection, table, or glaſs.

PERSPICUITY, *perſpicuitas*, in rhetoric, is a principal virtue of ſtyle, to which all the ornament and beauties of ſpeech ought to give way. See STYLE.

Voſſius obſerves, that a diſcourſe is obſcured by too much conciſeneſs and profuſeneſs; ſeveral rhetorical figures are likewiſe deſtructive of perſpicuity.

PERSPIRATION, in medicine, the evacuation of the juices of the body through the pores of the ſkin. Perſpiration is diſtinguiſhed into ſenſible and inſenſible: and here ſenſible perſpiration is the ſame with ſweating, and inſenſible perſpiration, that which eſcapes the notice of the ſenſes; and this laſt is the idea affixed to the word perſpiration when uſed alone.

The veſſels, through which perſpiration is performed, lie obliquely under the ſcales of the ſcarf ſkin, and are ſo inconceivably ſmall, that from a calculation made by Leewenhoeck, it appears that the mouths of an hundred and twenty-five thouſand of them may be covered with a common grain of ſand. The matter of inſenſible perſpiration, is a fine ſubtile fluid which exhales from the body in the form of a vapour, and proceeds from the whole ſurface and from every cavity: it is of an aqueous and ſaline nature, and ſeems to have a great analogy with urine; becauſe in a healthy ſtate, the increaſe of the one diminiſhes the other. Many experiments prove its exiſtence. If you paſs your finger over the ſurface of a looking-glaſs, or any other poliſhed body, it will leave a track of moiſture. If you put your naked head near a white wall, expoſed to the ſun, the ſhadow of the vapours which proceed from the pores of the ſkin, may be plainly ſeen: or if you breathe upon glaſs, you may perceive it covered with ſmall drops of water; and the vapours which proceed from the lungs, are in winter condenſed by the cold, and form a kind of bluiſh miſt, proceeding from the mouth. Other experiments ſhew that the matter evacuated this way, is at leaſt in ſome countries more than equal to all the other evacuations by ſtool, urine, &c. Sanctorius found in Italy, under the circumſtances of a moderate diet, middle age, and eaſy life, that the matter inſenſibly perſpired was five-eights of that taken in for food; ſo that there only remained three-eighths for nutrition, and for the excrements of the noſe, ears, inteſtines, bladder, &c. The ſame author ſhews, that as much is evacuated by perſpiration in one day, as by ſtool in fourteen days.

But Dr. Bryan Robinſon, of Dublin, has found the caſe very different, both in England and Ireland, and even in South Carolina, in all which places he found that the quantity of urine exceeds that of perſpiration, and that if the meat and drink of one day be four pounds and a half, the perſpiration of that day will be two pounds, the urine two pounds five ounces, and the ſtool three ounces.

The matter of ſweat is ſeparated from the blood by the miliary glands, and is therefore much more groſs than that of inſenſible perſpiration; for as there are no glands which ſerve for the excretion of

of this laſt fluid, it is ſuppoſed to proceed from the extremities of the capillary arteries.

The uſe of perſpiration is to preſerve the ſuppleneſs of the papillæ of the ſkin; to carry the ſaline particles off from the blood, and by this means to render it more pure; to preſerve the body from various diſeaſes, and to contribute to the cure of the moſt dangerous diſtempers. It may be promoted by exerciſe, by dry frictions with a coarſe linen-cloth, or a fleſh-bruſh, by warm baths, and waſhing the hands, feet, head, &c.

PERTH, the capital of the county of the ſame name in Scotland, thirty miles north of Edinburgh.

PERTHAMBOY, a port-town of New Jerſey, in North America: weſt long. 74°, north lat. 40° 45′.

PERTHOIS, a ſubdiviſion of the province of Champaign, in France, ſituated on the confines of Lorrain.

PERTICATA, in old law-books, is the fourth part of an acre; or a piece of ground containing one pearch in breadth, and four in length.

PERU, formerly a powerful empire in South America, but now a province of Spain, is ſituated between 60° and 81° of weſt longitude, and between the equator and 25° of ſouth latitude: being near 2000 miles in length from north to ſouth, and from 200 to 500 broad: it is bounded by Popayan, on the north; by the mountains of Andes, on the eaſt; by Chili and La Plata, on the ſouth; and by the Pacific Ocean, on the weſt.

Balſam of PERU. See BALSAM.

PERUGIA, a city of Italy, in the territories of the pope: eaſt long. 13° 16′, north lat. 43°.

PERUVIAN BARK. See QUINQUINA.

PES FORESTÆ, the foreſt foot, an engliſh long meaſure, containing eighteen inches.

PES MONETÆ, in antient records, ſignifies a true and reaſonable adjuſtment of the real value of the current coin.

PESADE, or PESATE, in the manege, is a horſe's raiſing his fore-quarters, and bending his feet up to his body without ſtirring his hind-feet.

This motion is the true means to fix his head and haunches, and to hinder him from ſtamping with his feet.

PESARO, a city of Italy, in the province of Urbino, ſituated on the gulph of Venice: eaſt long. 14°, north lat. 44°.

PESCARA, a port-town of Italy, in the kingdom of Naples: eaſt long. 15° 25′, north lat. 42° 30′.

PESCHIERA, a town of Italy, in the territory of Venice, and province of Verona: eaſt longitude 11°, north latitude 45° 35′.

PESSARY, in medicine, a ſolid ſubſtance compoſed of wool, lint, or linen, mixed with powder, oils, wax, &c. made round and long like a finger, in order to be introduced into the exterior neck of the matrix, for the cure of ſeveral diſorders incident to the uterus.

This name is alſo ſometimes given to pieces of cork, or other matters thruſt up the noſtrils, &c. to prevent the entrance of ſtrong infectious ſteams.

PEST, a city of Upper Hungary, ſituated on the Danube: eaſt long. 19° 15′, north lat. 47° 42′.

PEST-HOUSE, the ſame with lazaretto or lazar-houſe. See LAZAR-HOUSE.

PESTILENCE, in medicine, an epidemical, contagious and malignant diſeaſe, popularly known by the name of plague. See the article PLAGUE.

PESTILENTIAL FEVERS, ſuch as are attended with ſome malignant quality, and approach to the nature of the plague. See the articles BILIOUS-FEVERS, and HOSPITAL FEVER.

PETAL, among botaniſts, an appellation given to the flower-leaves, in oppoſition to the folia, or common leaves of the plant.

According to the number of petals in each flower it is ſaid to be monopetalous, or to conſiſt of a ſingle petal; dipetalous, when it has two; tripetalous, when three, &c. See the article FLOWER.

PETALISM, πεταλισμος, in antiquity, a kind of baniſhment practiſed at Syracuſe, by writing the perſon's name on a leaf, πεταλον, whence the name.

It differed only from the oſtraciſm at Athens, as this laſt was voted by means of ſhells, οστρακα, and laſted ten years; whereas, the petaliſm was voted by means of leaves, and laſted only five years.

PETARD, in the art of war, a metalline engine, ſomewhat reſembling a high-crowned hat.

The petard may be conſidered as a piece of ordnance; it is made of copper mixed with braſs, or of lead with tin: its charge is from five to ſix pounds of powder, which reaches to within three fingers-breadth of the mouth; the vacancy is filled with tow, and ſtopped with a

wooden tampion, the mouth being ſtrongly bound up with cloth tied very tight with ropes. It is covered up with a madrier, or wooden plank, that has a cavity to receive the mouth of the petard, and faſtened down with ropes, as repreſented in plate CXCVII. fig. 5.

Its uſe is in a clandeſtine attack to break down gates, bridges, barriers, &c. to which it is hung; and this it does by means of the wooden plank. It is alſo uſed in countermines to break through the enemy's galleries, and give their mines vent.

The invention of petards is aſcribed to the french Huguenots, in 1579, who with them took Cahors, as D'Aubigné tells us.

PETARDEER, a perſon who loads, fixes, and fires petards. See the preceding article.

PETASITES, BUTTERBUR, in botany, is comprehended by Linnæus among the tuſſilagos, or colts-feet. See the article TUSSILAGO.

The root of the common butterbur is celebrated for its cordial and alexipharmic virtues; and beſides being aperient and detergent, is preſcribed in ſuppreſſions of urine and the menſes; as alſo in the cough, aſthma, and other diſorders of the breaſt.

PETASUS, in antiquity, a covering for the head, with a broad brim, not unlike that of our hats, uſed on journies to ſave the face from being ſun-burnt.

PETECHIÆ, in medicine, denote ſpots in the ſkin like flea-bites, which come out in malignant fevers, hence called petechial, or ſpotted fevers. See the article MALIGNANT.

The more florid the ſpots are, the leſs is the danger; and it is a good ſign if the black or violet coloured ones become of a brighter colour. The large, black, and livid ſpots, are almoſt always attended with profuſe bleeding: the ſmall duſky-brown ſpots, like freckles, are almoſt as bad as the black and livid ones.

The eruption of the ſpots is uncertain; ſometimes they appear on the fourth or fifth day, ſometimes not till the eleventh, or later. The vibices, or large livid, or darkiſh-green marks, ſeldom appear till very near the fatal period.

The treatment in all malignant fevers is much the ſame with that of the hoſpital-fever. See the article HOSPITAL-FEVER.

PETER, or *Epiſtles of St.* PETER, two canonical books of the New Teſtament, written by the apoſtle St. Peter, and addreſſed to thoſe jewiſh converts who were ſcattered throughout Pontus, Galatia, &c. not only upon the perſecution raiſed at Jeruſalem, but upon former diſperſions of the Jews into thoſe places. The firſt of theſe epiſtles is principally deſigned to comfort and confirm them, under thoſe fiery trials they were then ſubject to; and to direct them how to behave in the ſeveral ſtates and relations, both of the civil and the chriſtian life. In the ſecond epiſtle, the apoſtle proſecutes the ſame ſubject, to prevent their apoſtacy from the faith, and guard them againſt the corrupt principles of the gnoſtics, and thoſe who ſcoffed at the promiſe of Chriſt's coming.

St. PETER'S DAY, a feſtival of the chriſtian church, obſerved on the twenty-ninth of June.

PETERBOROUGH, a city of Northamptonſhire, ſituated on the river Nen, thirty-four miles north-eaſt of Northampton: weſt long. 15', north lat. 52° 53'.

It ſends two members to parliament.

PETER-PENCE, an antient tax of a penny on each houſe, paid to the pope.

It was called peter-pence becauſe collected on the day of St. Peter *ad vincula*, and ſent to Rome; whence it was alſo called Rome-ſcot and Rome-penny.

PETERSBURG, the capital city of Ruſſia, and one of the largeſt and moſt populous cities in the world, ſituated on both ſides the river Nieva, in the provinces of Carelia and Ingria, between the gulph of Finland and the lake Ladoga: eaſt long. 31°, north lat. 60°. There were no leſs than ſixty-five thouſand houſes built within three or four years after the foundation was laid, which was in the year 1703.

PETERSFIELD, a borough-town of Hampſhire, fifteen miles ſouth-eaſt of Wincheſter.

It ſends two members to parliament.

PETERSHAGEN, a town of Germany, in the circle of Weſtphalia and dutchy of Minden, thirty-ſeven miles weſt of Hanover: ſubject to Pruſſia.

PETERWARADIN, a fortified town of Sclavonia, ſituated on the Danube, thirty-five miles north-weſt of Belgrade.

PETHERTON, a market-town of Somerſetſhire, 16 miles ſouth-weſt of Wells.

PETIGLIANO, a town of Italy, in the dutchy of Tuſcany: eaſt long. 12° 45'. north lat. 42° 45'.

PETIOLE, *petiolum*, in botany, the ſlender ſtalk that ſupports the leaves of a plant.

Some

Some alſo uſe the word petiole for the middle rib of a leaf; the branches thereof being called rami, and the ſubdiviſions of theſe ſurculi.

PETITGUAVES, a port-town of Hiſpaniola, ſituated on a bay at the weſt end of the iſland: weſt long. 76°, north lat. 18° 5′: ſubject to France.

PETITIO INDUCIARUM, in the civil-law, the ſame with imparlance in common law. See IMPARLANCE.

PETITIO PRINCIPII, in logic, the taking a thing for true, and drawing concluſions from it as ſuch; when it is really falſe, or at leaſt wants to be proved, before any inferences can be deduced from it.

PETITION, a formal ſupplication or requeſt made by an inferior to a ſuperior, eſpecially to one having ſome juriſdiction. By ſtatute no perſon ſhall procure above twenty hands to a petition to the king or parliament, for any alteration either in church or ſtate, unleſs by order of three or more juſtices of the peace, &c. nor ſhall deliver ſuch petition in the preſence of above ten perſons, on pain of forfeiting one hundred pounds. 13 Car. II. c. 5.

PETIVERIA, in botany, a genus of the hexandria-tetragynia claſs of plants, without any flower-petals, only the cup being coloured red has much the appearance of ſuch: the ſeed is ſingle, flatted and emarginated, and armed with the four ſtyles.

PETRE, or SALT-PETRE, the ſame with nitre. See the article NITRE.

PETREA, in botany, a genus of the didynamia-angioſpermia claſs of plants, with a monopetalous flower, divided into five rounded ſegments at the limb. There is no deſcription of the fruit or ſeed of this plant.

PETRIDIA, in natural hiſtory, a genus of ſcrupi, of a plane, uniform ſtructure, of no great variety of colours, and emulating the external form of pebbles. See the article SCRUPI.

Dr. Hill deſcribes no leſs than twelve ſpecies of this genus. 1. The various-ſized, pellucid, colourleſs, cryſtalliform petridium, commonly called the pebble-cryſtal. 2. The purple, ſemipellucid, cryſtalline petridium. 3. The ſnow-white, opake, cryſtalline petridium. 4. The opake, whitiſh, reddiſh, or yellowiſh, cryſtalline petridium, commonly called red, white, and yellow, ſparry pebbles. 5. Yellowiſh, white, pumicoſe, or ſpungy petridium. 6. Hard, porous, whitiſh, cryſtalline petridium. 7. Greyiſh, white, opake, ſtony petridium. 8. Friable, ſhining, white, arenaceous petridium. 9. White, cryſtalline petridium, ſpotted with ſmall yellow dots. 10. Whitiſh-brown, dull petridium. 11. Bluiſh, white, hard cryſtalline petridium. And, 12. Browniſh, white, hard, ſhining petridium.

PETRIFACTION, in phyſiology, denotes the converſion of wood, bones, and other ſubſtances into ſtone. See the article STONE.

The foſſile bodies found petrified are principally either of vegetable or animal origin, and are more or leſs altered from their original ſtate, according to the different ſubſtances they have lain buried among in the earth; ſome of them having ſuffered very little change, and others being ſo highly impregnated with cryſtalline, ſparry, pyritical, or other extraneous matter, as to appear mere maſſes of ſtone or lumps of the matter of the common pyrites; but they are generally of the external dimenſions, and retain more or leſs of the internal figure of the bodies into the pores of which this matter has made its way.

The animal ſubſtances thus found petrified are ſea-ſhells, the teeth, bony palates and bones of fiſh, the bones of land animals, &c. Theſe are found variouſly altered, by the inſinuation of ſtony and mineral matter into their pores; and the ſubſtance of ſome of them is now wholly gone, there being only ſtony, ſparry, or other mineral matter remaining in the ſhape and form. See the articles FOSSIL, *Foſſil* PLANTS, SHELLS, &c.

PETROBRUSSIANS, in church-hiſtory, a religious ſect which aroſe in France and the Netherlands, about the year 1126, ſo called from their leader Peter Bruys. They denied that children, before the uſe of reaſon, can be juſtified by baptiſm. They alſo condemned all places of public worſhip, croſſes, crucifixes; and are ſaid to have rejected the ſacrament of the euchariſt, and prayers for the dead.

PETROLEUM, alſo called rock-oil, or oil of petre, is an extremely ſubtle and penetrating fluid, and is by much the thineſt of all the native bitumens. It is very light and very pellucid; but tho' equally bright and clear under all circumſtances, it is liable to a very great variety in its colour. It is naturally almoſt colourleſs, and in its appearance greatly reſembles the moſt pure oil of turpentine:

this is called white petroleum, though it has no more colour than water; it is ſometimes tinged of a browniſh, reddiſh, yelloviſh, or faint-greeniſh colour; but its moſt frequent colour is a mixture of the reddiſh and blackiſh, in ſuch a degree that it looks black when viewed behind the light, but purple when placed between the eye and a candle or window. It is of a pungent and acrid taſte, and of a very ſtrong and penetrating ſmell, which very much approaches to that of the diſtilled oil of amber. The white is moſt eſteemed. It is ſo very inflammable, that while it floats on the ſurface of the water, as it does in many parts of Italy, it takes fire at the approach of a candle.

Petroleum is found in rivers, in wells, and trickling down the ſides of hills along with little ſtreams of water. In ſhort, it is the moſt frequent of all the liquid bitumens, and is perhaps the moſt valuable of them all in medicine. It is to be choſen the pureſt, lighteſt, and moſt pellucid that can be had, ſuch as is of the moſt penetrating ſmell and is moſt inflammable.

It is principally uſed externally, in paralytic caſes, and in pains of the limbs. The French give it internally in hyſteric complaints, and to their children againſt worms; ſome alſo give it from ten to fifteen drops in wine, for ſuppreſſion of the menſes. Theſe, however, are rather the practice of the common people than of the faculty.

PETROMYZON, in ichthyology, a genus of the chondropterygious order of fiſhes, the foramina, or aperture, of whoſe gills are ſeven on each ſide, ſituated longitudinally; and there is, beſide theſe, one in the middle of the head, between the eyes: the body is long and ſlender, and nearly cylindric, and is ſmooth: there are only two fins, both ſituated on the back of the fiſh.

To this genus belong the lamprey, and lamprey-eel. See LAMPREY.

PETRONEL, a ſort of harquebuſs, or hand-gun. See HARQUEBUSS.

PETROSA OSSA, in anatomy, a name given to the fourth and fifth bones of the cranium, called alſo oſſa temporum, and oſſa ſquamoſa; the ſubſtance whereof, as their firſt and laſt names expreſs, is ſquamoſe and very hard. See the article SKULL.

Thoſe bones are ſituated in the lateral and lower part of the head; and are bounded at top by the ſquamous ſuture, which joins them to the parietalia, and behind by the lambdoides, which joins them to the occipital, and connects them to the os ſpheroides. Each has two ſinuſes, before and behind the ſphenoides: the exterior, which is lined with a cartilage, and receives the proceſs of the lower jaw; the interior receives the lower part of the ſinus lateralis of the dura mater: each again has four proceſſes, three of which are external, and one internal: of the external, the firſt is called the zygomatic, or jugal; the ſecond, the maſtoide, or mammillar; the third, the ſtyloide; each of which ſee under its proper article.

The internal proceſs is properly called the os petroſum; this is pretty long and large, containing the whole meatus auditorius, and cavity of the tympanum. See the article EAR.

PETTAW, a city of Germany, in the circle of Auſtria: eaſt longitude 16° 8′, north latitude 47°.

PETTEIA, πεττεία, in the antient muſic, the art of making a juſt diſcernment of all the manners of ranging or combining ſounds among themſelves, ſo as they may produce their effect, that is, expreſs the ſeveral paſſions they are intended to raiſe: it ſhews what ſounds are to be uſed, and what not; how often any of them are to be repeated, with which to begin, and with which to end: Petteia, therefore, is in muſic what manners are in poetry.

PETTIPOLI, a port-town on the coaſt of Cormandel, in the hither India, where the Dutch have a factory: eaſt long. 80°, north lat. 16° 45′.

PETTREL, in ornithology, a name for the procellaria, or ſtorm-bird. See the article PROCELLARIA.

PETWORTH, a town of Suſſex, ten miles north-eaſt of Chicheſter.

PETTY-BAG, an office in chancery, the three clerks of which record the return of all inquiſitions out of every county, and make all patents of comptrollers, gaugers, cuſtomers, &c.

PETTY-FOGGER, a little, tricking ſolicitor or attorney, without either ſkill or conſcience.

PETTY, or PETIT LARCENY. See the article LARCENY.

PETTY-PATEES, among confectioners, a ſort of ſmall pies, made of a rich crust filled with ſweat-meats.

PETTY-SINGLES, among falconers, are the toes of a hawk.

PETTY-

PETTY-TALLY, in the ſea-language, a competent allowance of victuals, according to the number of the ſhip's company.

PETTY, or PETIT-TREASON. See the article TREASON.

PETUNSE, in natural-hiſtory, one of the two ſubſtances whereof the porcelain or china-ware is made. See PORCELAIN. The petunſe is a coarſe kind of flint or pebble, the ſurface of which is not ſo ſmooth, when broken, as that of our common flint. See the article FLINT.

PEUCEDANUM, HOG'S FENNEL, in botany, a genus of the pentandria-digynia claſs of plants, the general corolla of which is uniform, and each ſingle flower conſiſts of five equal, oblong, crooked and undivided petals; there is no pericarpia; the fruit is oval and compreſſed. The root of hog's fennel is recommended in the cough and other diſorders of the breaſt, and in obſtructions of the viſcera.

PEWTER, a factitious metal, uſed in making domeſtic utenſils, as plates, diſhes, &c.

The baſis of this metal is tin, which is converted into pewter, by mixing at the rate of an hundred weight of tin with fifteen pounds of lead and ſix pounds of braſs. See the article METAL.

Beſides this compoſition, which makes the common pewter, there are other kinds compounded of tin, regulus of antimony, biſmuth and copper, in ſeveral proportions.

Pewter has occaſionally ſerved for money. According to Mr. Putland, king James II. turned all the pewter veſſels of the proteſtants in Ireland he could ſeize, into money; half-crowns were ſomewhat bigger than half-pence, and other pieces in proportion. This money he ordered to be current in all payments; whence, our author obſerves, people abſconded for fear of being paid their debts; he alſo mentions crown-pieces of this metal, with the legend on the rim, *melioris teſſera fati*.

PEYBUS, or PEPUS. See PEPUS.

PEZENAS, a town of Languedoc, in France, thirty miles ſouth-weſt of Montpelier.

PEZIZA, in botany, a genus of muſhrooms, of a campanulated figure, with orbiculated convexo-plane ſeeds. See the article MUSHROOM.

PFALTSBURG, a town of Lorrain, fifty miles eaſt of Nancy.

PFRIT, or FORETTE, a town of Upper-Alſace, ten miles weſt of Baſil.

PFORTSHEIM, a city of Swabia, 28 miles ſouth-weſt of Hallbron.

PHACA, in botany, the ſame with the aſtragaloides. See ASTRAGALOIDES.

PHÆNOMENON, φαινόμενον, in philoſophy, denotes any remarkable appearance, whether in the heavens or on earth; and whether diſcovered by obſervation or experiments.

PHAGEDÆNA, φαγέδαινα, in ſurgery, denotes a corroding ulcer. See the article ULCER.

PHAGEDÆNIC MEDICINES, thoſe uſed to eat off fungous or proud fleſh: ſuch are all the cauſtics. See CAUSTIC.

Lime-water has this virtue in ſo high a degree, that it has got the name of phagedænic-water. See the article LIME.

PHALÆNA, in the hiſtory of inſects, a genus of inſects, of the order of the lepidoptera, the antennæ whereof are attenuated to the point, not clavated: the ſpecies of this genus are very numerous; ſome of them have the antennæ of a priſmatic form; ſome have them pectinated, or made in faſhion of a comb, and of theſe laſt, ſome have no tongue, and others have a ſpiral one; ſome have the antennæ pectinated, and ſit with the wings flat or plane; others ſit with the wings plane and patent, and have ſimple antennæ and a ſpiral tongue; ſome have the antennæ ſimple, and the tongue ſpiral, but do not ſit with the wings plane, and of theſe ſome have the forehead prominent, others not; others again have the antennæ ſimple, and have no tongue.

PHALANGIUM, in zoology, the name of ſeveral ſpecies of ſpiders. See the article SPIDER.

PHALANGIUM, or ANTHERICUM, SPIDER-WORT, in botany, a genus of the hexandria-monogynia claſs, the flower of which conſiſts of ſix very patent, oboblong petals; and its fruit is an oval capſule with three cells, containing a great many angulated ſeeds.

Dale ſays that this plant is good againſt gripes, and the bites of ſpiders.

PHALANX, in grecian antiquity, a ſquare battalion, conſiſting of eight thouſand men, with their ſhields joined, and pikes croſſing each other; ſo that it was next to impoſſible to break it.

Some think that the macedonian phalanx had the advantage of the roman legion. See the article LEGION.

The

The term phalanx, in anatomy, ſignifies three rows of ſmall bones in the fingers. See the article FINGERS.

PHALARIS, in botany, a genus of the triandria-digynia claſs of plants, with a bivalve corolla, and only a ſingle ſeed contained in the corolla.

PHALEUCIAN VERSE, in antient poetry, a kind of verſe which conſiſts of five feet, the firſt of which is a ſpondee, the ſecond a dactyl, and the three laſt trochees; ſuch is the following one of Martial,

1 2 3 4 5
Summam|nec metu|as di|em, nec|optes.

PHALLUS, in botany, a genus of muſhrooms, with a ſmall umbilicated and perforated head. See MUSHROOM.

PHANATIC, a term of reproach formerly given to the diſſenters, from a falſe ſuppoſition that they pretended to viſions, &c.

PHANTASM, φαντασμα, a term ſometimes uſed in a ſynonymous ſenſe with idea, or the notion retained in the mind of an external object. See IDEA.

PHANTASTIC STYLE, in muſic, denotes a free and eaſy manner of compoſition, proper for inſtruments.

The peripatetics gave the colours of the rainbow the appellation of phantaſtic, as ſuppoſing them to be only phantoms or deceptions of the ſight; but Sir Iſaac Newton has demonſtrated the contrary. See the article COLOUR.

PHANTASY, or FANCY, the ſame with imagination. See IMAGINATION.

PHARISEES, a famous ſect of the Jews, who diſtinguiſhed themſelves by their zeal for the traditions of the elders, which they derived from the ſame fountain with the written word itſelf; pretending that both were delivered to Moſes from Mount Sinai, and were therefore both of equal authority. From their rigorous obſervance of theſe traditions, they looked upon themſelves as more holy than other men, and therefore ſeparated themſelves from thoſe whom they thought ſinners or prophane, ſo as not to eat or drink with them; and hence, from the hebrew word *pharis*, which ſignifies to ſeparate, they had the name of phariſees, or ſeparatiſts.

Their pretences to extraordinary piety, drew after them the common people, who held them in the higheſt eſteem and veneration. They held a reſurrection from the dead, and the exiſtence of angels and ſpirits; but, according to Joſephus, this was no more than a pythagorean reſurrection, that is, of the ſoul only, by its tranſmigration into another body, and being born anew with it. From this reſurrection they excluded all who were notoriouſly wicked, being of opinion, that the ſouls of ſuch perſons were tranſmitted into a ſtate of everlaſting woe: but as to leſſer crimes, they imagined they were puniſhed in the bodies which the ſouls of thoſe who committed them were next ſent into.

According to this notion it was, that Chriſt's diſciples aſked him, concerning the blind man, "Who did ſin, this "man or his parents, that he was born "blind?" With the eſſenes, they held abſolute predeſtination; and with the ſadducees, free-will: but how they reconciled theſe ſeemingly incompatible doctrines, is no where ſufficiently explained.

PHARMACY, the art or ſcience which teaches the election, preparation, and mixture of medicines; conſtituting one part of the therapeutic branch of medicine, the objects of which are all natural bodies. See MATERIA MEDICA.

As to the choice of ſimple drugs, of which medicines are prepared, regard muſt be had to the places of their growth, the climate, the ſeaſon when they are moſt in perfection, and the like.

The preparation of them conſiſts, 1. In waſhing and freeing them from groſs and uſeleſs parts. 2. Herbs, flowers, fruits, and roots muſt be dried. 3. Filings of ſteel muſt be moiſtened with rain-water. 4. Some drugs muſt be infuſed in liquors, in order to diſſolve them, as ceruſe in vinegar; and others boiled to ſoften them, as the roots of althæa. 5. Some things, again, are to be ſawed, or cut; others chopped, raſped, or filed; and, finally, others bruiſed or broken, as roots and dried fruits.

The mixture of medicines conſiſts in blending and uniting them together, to make compoſitions. To perform this properly, we muſt learn to diſtinguiſh thoſe ingredients which unite together naturally, from thoſe which will not mix but by the aſſiſtance of art. Oil, for inſtance, mixes very well with fat ſubſtances; but will not unite, unleſs imperfectly, with water. The ſpirit of ſalt ſeems to mix tolerably well with ſpirit of wine; but their union will be rendered more intimate by digeſting them together, for ſome days, in a ſand-heat, and then diſtilling them. We

ſhould

ſhould likewiſe know the method of mixing ſeveral drugs, whether by pounding them in a mortar, diſſolving, boiling, &c. The order of mixing drugs muſt likewiſe be obſerved: thus pulps ought to be mixed before powders, odoriferous ingredients ſhould be mixed laſt, &c. Many other remarks might be made, relating to the compoſition of medicines; but they will come in more properly among the directions for making each particular ſort, as they will be much better comprehended when the operations themſelves are examined.

Some divide pharmacy into two parts, the galenic and chemical. See the articles GALENIC and CHEMISTRY.

PHARNACEUM, in botany, a genus of the pentandria-trigynia claſs of plants, without any corolla; but the calyx reſembles one, being coloured on the inſide, and its edges thin; the fruit is an oval capſule, obſcurely trigonal, and in part covered by the cup; it conſiſts of three cells, in which are contained numerous nitid, orbiculated, and depreſſed ſeeds, ſurrounded with a margin.

PHAROS, a ſmall iſland in the Mediterranean ſea oppoſite to Alexandria, in Egypt.

PHAROS, or PHARE, a LIGHT-HOUSE, a pile raiſed near a port, where fire is kept burning, in the night, to guide and direct veſſels near at hand. The pharos of Alexandria, built in the iſland of Pharos, at the mouth of the Nile, was antiently very famous, inſomuch as to communicate its name to all the reſt. This moſt magnificent tower conſiſted of ſeveral ſtories and galleries, with a lantern at top, which being continually burning, might be ſeen for many leagues at ſea, and along the coaſt.

PHARSALUS, a town of antient Theſſaly, ſituated in european Turky, a little ſouth of Lariſſa, in eaſt long. 23°, and north lat. 39°.

PHARYNX, in anatomy, the upper part of the œſophagus. See OESOPHAGUS.

The muſcles of the pharynx ſerve to open or ſhut the œſophagus: theſe are in number three pair, *viz.* the ſtylopharyngæus, the pterygopharyngæus, and the œſophagæus. See the article STYLOPHARYNGÆUS, &c.

There are a number of glands ſituated in the pharynx; and excretory oſcula, or openings, are frequently diſcovered with them.

PHASACUM, in botany, a genus of the cryptogamia-muſci claſs of plants, without any calyptra or apophyſis.

PHASEOLUS, KIDNEY-BEAN, in botany, a genus of the diadelphia-decandria claſs of plants, the corolla whereof is papilionaceous; the vexillum is cordated, obtuſe, emarginated and reclined with reflex ſides; the alæ are roundiſh, of the ſame length with the vexillum, and ſtand upon long ungues; the carina is narrow, and revolves ſpirally in a contrary direction to the ſun; the fruit is a long, ſtraight, coriaceous, and obtuſe pod; the ſeeds are oblong, compreſſed, and kidney-ſhaped.

PHASES, φάσεις, in aſtronomy, the ſeveral appearances or quantities of illumination of the moon, venus, mercury, and the other planets; or the ſeveral manners wherein they appear illuminated by the ſun. See the articles MOON, MERCURY, VENUS, &c.

PHASIANUS, the PHEASANT, in ornithology. See PHEASANT.

PHASMATA, in phyſiology, certain appearances ariſing from the various tinctures of the clouds, by the rays of the heavenly luminaries, eſpecially the ſun and moon. Theſe are infinitely diverſified by the different figures and ſituation of the clouds, and the appulſes of the rays of light.

PHASSACHATES, in natural hiſtory, the name of a ſpecies of agate, which the antients, in its different appearances, ſometimes called alſo leucachates and perileucos. See the article AGATE.

The ſame agate, from the various proportion or manner of admixture of its particles in different ſpecimens, often makes a very different figure; but no ſpecies is ſo liable to remarkable diverſities of this kind as this. It is but of a ſmall variety of colours, yet is often very beautiful: its ground or baſis is always a pale, bluiſh grey, approaching to what we call a lead-colour or dove-colour. Sometimes it is equally and evenly of this colour, thro' the whole maſs: but often alſo it is variegated within with veins of a deep black, and of a pure and clear white; theſe ſometimes approach the ſurface of the ſtone, but more uſually they are only near the center; and they are almoſt always diſpoſed in concentrical, but irregular circles, round one, two, or more points. The pieces of this ſtone, cut where there are many of theſe veins, much reſemble parts of onyxes.

It is found in the Eaſt Indies, and in Bohemia,

Bohemia, and ſome other parts of Europe. When the whole matter of the veins and baſis of this ſtone are blended together into one equal maſs, as is frequently the caſe both with this and many other of the naturally veined ſtones, the whole becomes of a deeper greyiſh blue, or a dove-colour, and is then the phaſſachates; when the veins are kept diſtinct and clear, it is the leucachates and perileucos, agreeing with all the deſcriptions of the antients.

PHEASANT, *phaſianus*, in ornithology, a genus of birds of the order of the gallinæ, with the ſpace about the eyes naked, and no wattles.

The common pheaſant would be very common in our woods, if it were not ſo univerſally the delight of the ſportſman and of the table. There are two other ſpecies, *viz.* the ſcarlet-breaſted pheaſant, nearly of the ſize of the common kind; and the long-tailed, horned, and elegantly variegated pheaſant of the Eaſt Indies: this laſt is covered all over with a profuſion of the brighteſt colours, yellow, red, white, bluiſh-green, and almoſt every tinge; it has alſo two callous ſubſtances, like horns, of a fine blue colour, above the eyes; and on each ſide hangs a looſe ſkin, of the ſame colour, with ſpots of an orange colour. See plate CXCVII. fig. 4.

Pheaſants, on being imported from chriſtmas to midſummer, pay a duty of 15 s. $4\frac{80}{100}$ d. the dozen, and draw back on exportation 13s. 6d. and pheaſant-pouts, from midſummer to chriſtmas, pay on importation 9 s. $7\frac{1}{2}$ d. the dozen, and draw back on exportation 8 s. $5\frac{1}{4}$ d.

PHEASANTS-ISLE, a little iſland in the river Bidaſſoa, which divides France and Spain, ſituated in weſt longit. 1° 20′, and north lat. 43° 20′.

PHELLANDRIUM, WATER-HEMLOCK, in botany, a genus of the pentandria-digynia claſs of plants, the general corolla whereof is nearly uniform; the ſingle flowers are unequal, they are compoſed each of five acuminated cordato-inflex petals; the fruit is naked, ſmooth, and coronated with the perianthium and piſtils; it is ſeparable into two parts: the ſeeds are two, oval and ſmooth.

PHELYPÆA, in botany, a genus of the didynamia-angioſpermia claſs of plants, the corolla whereof conſiſts of a ſingle ringent petal; the tube is very ſhort and roundiſh; the faux is oblong, and the limb patent on both ſides; the fruit is a roundiſh, acuminated, compreſſed capſule, containing one cell, and made up of two valves; the ſeeds are numerous and oblong.

PHENICIA, or PHOENICIA, a ſubdiviſion or province of Syria, ſituated on the Levant, or eaſtern part of the Mediterranean ſea, on the confines of Paleſtine.

PHEONS, in heraldry, the barbed heads of darts, arrows, or other weapons, and uſually repreſented as in plate CC. fig. 4.

PHIAL, a ſmall thin glaſs-bottle, vulgarly called a vial.

PHIDITIA, in grecian antiquity, feaſts celebrated with great frugality at Lacedæmon. The phiditia were held in the public places, and in the open air: rich and poor aſſiſted at them alike, and on the ſame footing; their deſign being to keep up peace, friendſhip, and a good underſtanding and equality among all the citizens, great and ſmall. It is ſaid, that they who attended this feaſt, brought each a buſhel of flour, eight meaſures of wine named chorus, five minæ of cheeſe, and as much figs.

PHILADELPHIA, the capital of the province of Penſilvania, in North America, ſituated on the rivers Delawar and Schoolkill: weſt long. 74°, north lat. 40° 50′.

PHILADELPHIA is alſo the name of an antient town of the leſſer Aſia, ſituated in eaſt long. 29°, north lat. 38°.

PHILAUTIA, in the ſchools, ſignifies ſelf-love, or a vicious fondneſs and complaiſance for a man's ſelf.

PHILADELPHUS, or SYRINGA, in botany, a genus of the icoſandria-tetragynia claſs of plants, the flower of which conſiſts of four large, patent, roundiſh, and emarginated petals; the fruit is an oval capſule, pointed at each end, and containing four cells, in which are lodged numerous oblong and ſmall ſeeds.

PHILIP-FORT, a fortreſs in dutch Brabant, ſituated on the eaſt ſide of the Scheld, oppoſite to Pearl-fort five miles north-weſt of Antwerp.

PHILIPS-NORTON, a market-town of Somerſetſhire, ſituated five miles ſouth of Bath.

PHILIPPI, an antient town of Macedonia, a province of european Turkey, ſituated in eaſt long. 25°, north lat. 41°.

PHILIPPICS, φιλιππικοι λογοι, in literature, a name given to the orations of Demoſthenes againſt Philip king of Macedon; being eſteemed the maſter pieces of that great orator.

Philippic

Philippic is also a term applied to the fourteen orations of Cicero against Mark Anthony.

PHILIPPINE ISLANDS are situated in the Pacific ocean, in Asia, between 114° and 131° east longitude, and between 5° and 19° north latitude: there are a great number of them, and some very large. See LUCONIA, MENDANAO, &c.

PHILIPPINES, a religious society of young women, at Rome; so called from their taking St. Philip de Neri for their protector: they consist of an hundred poor girls, who are brought up till they are of age to be married, or become nuns, under the direction of some religious women, who teach them to read, write, and work; and instruct them in the duties of christianity. They wear a white veil, and a black cross on their breasts.

PHILIPPOPOLI, a city of european Turky, in the province of Romania, situated on the river Mariza, in east long. 25°, and north lat. 42° 20′.

PHILIPSBURGH, a city of Germany, in the palatinate of the Rhine, situated on the east bank of the river Rhine, in east long. 8° 16′, north lat. 49° 8′.

PHILIPSTAT, a town of Sweden, in the province of Gothland and territory Wermeland, situated in east long. 14°, north lat. 59° 50′.

PHILIPVILLE, a town of the french Netherlands, in the province of Hainalt, twenty-two miles south-west of Namur.

PHILIZER, or PHILAZER. See the article FILAZER.

PHILLYREA, or PHYLLYREA, in botany, a genus of the diandria-monogynia class of plants, the corolla whereof consists of a single petal, divided into four short segments at the limb; the fruit is a globose berry, with only one cell, in which is a single large seed, of the same shape.

The leaves and bark of this shrub are said to be astringent and good in ulcers of the mouth; but they are little regarded in the present practice.

PHILOLOGY, φιλολογια, a science or rather assemblage of several sciences, consisting of grammar, rhetoric, poetry, antiquities, history, and criticism.

Phylology is a kind of universal literature, conversant about all the sciences, their rise, progress, authors, &c. It makes what the French call the *belles lettres*. In the universities it is called humanities. Antiently, philology was only a part of grammar.

PHILOMATHES, a lover of learning or science.

PHILONIUM, in pharmacy, a kind of somniferous anodyne opiate, taking its name from Philo the inventor.

There are two kinds of philonium, the persian and the roman, the first of which is prepared thus: take of white pepper and white-henbane, each ten drams; of opium, terra-sigillata, each five drams; lapis hæmatitis, saffron, each two drams and an half; castor, indian-spikenard, pyrethrum, pearls, amber, zedoary, doronicum, or else elecampane, troches of ramich, each half a dram; camphor, a scruple; honey of roses, fifteen ounces: mix them together for an opiate. The roots, the seeds, the castor, the saffron, and the troches of ramich, are to be reduced to a powder together; and the blood-stone, the pearls, and the amber, are to be levigated on a marble till they are reduced to an impalpable powder; and the sealed earth, and the camphire, are to be pounded together. This preparation is proper for stopping hæmorrhages and fluxes, as also for preventing abortions: the dose of it is from one scruple to one dram.

The philonium romanum is thus prepared: take of white-pepper and white-henbane-seeds, each five drams; opium, two drams and a half; cassia-bark, one dram and a half; smallage-seed, one dram; and the seeds of macedonian-parsley, fennel, and candy-carrots, each two scruples five grains; saffron, one scruple and a half; spikenard, pellitory of Spain, and zedoary, each fifteen grains; cinnamon, a dram and a half; myrrh and castor, each a dram; syrup of white poppies, a sufficient quantity to make the whole into an electuary. This is a powerful opiate, and given from ten grains to two scruples, to ease violent pains and procure sleep.

PHILOSOPHER, φιλοσοφος, a person versed in philosophy; or one who makes profession of, or applies himself to, the study of nature and morality. See the article PHILOSOPHY.

PHILOSOPHER'S STONE, the greatest object of alchymy, is a long sought for preparation, which, when found, is to convert all the true mercurial part of metal into pure gold, better than any that is dug out of the mines, or perfected by the refiner's art; and this only by casting a little quantity thereof upon metals in fusion, whilst that part of the metal which

which was not mercury is immediately burnt or blown away. This ſtone is ſaid to be equal in weight to gold, brittle like glaſs, of a deep red colour, and melting like wax by the fire. Alchemiſts have not only promiſed this, but promiſed alſo to make the like ſtone for ſilver, which ſhall convert all metals, except gold and ſilver, into the fineſt ſilver. They have further, ſays Boerhaave, promiſed to perfect the philoſopher's ſtone to ſuch a degree, that being projected upon any quantity of gold melted by the fire, it may convert the whole ſubſtance into philoſopher's ſtone; and, to exalt the ſame ſtill farther, that being projected upon pure quickſilver, it ſhall convert the whole into philoſopher's ſtone. See the article TRANSMUTATION *of metals*.

All required is, ſay the alchemiſts, to do that by art which nature does in many years and ages; for as gold and lead do but differ little in weight, therefore there is not much in lead beſides mercury and gold. Now if any body could be found which would ſo agitate all the parts of lead, as to burn all that is not mercury therein, having alſo ſulphur to fix the mercury, would not the maſs remaining be converted into gold? Such is the foundation for the opinion of the philoſopher's ſtone, which alchymiſts contend to be a moſt fixt, concentrated fire, which, as ſoon as it melts with any metal, does, by a magnetic virtue, immediately unite itſelf to the mercurial body of the metal, volatilizes and cleanſes off all that is impure therein, and leaves nothing but a maſs of pure gold.

There are two other ways whereby alchemiſts have attempted to arrive at the making of gold: the firſt is by ſeparation; for it is affirmed, that every metal yet known contains ſome quantity of gold, only in moſt the quantity is ſo ſmall that it will not defray the expence of getting it out.

The ſecond is by maturation, for the alchemiſts hold mercury to be the baſis and matter of all metals; that quickſilver, purged from all heterogeneous bodies, would be much heavier, denſer and ſimpler than the native quickſilver; and that by ſubtilizing, purifying, and digeſting it, with much labour and long operations, it may be converted into pure gold. See the article GOLD.

PHILOSOPHER'S TREE. See the article DIANÆ ARBOR.

PHILOSOPHIC, or PHILOSOPHICAL, ſomething that relates to philoſophy. See PHILOSOPHY and PHILOSOPHER.

PHILOSOPHIC CHEMISTRY. See the article CHEMISTRY.

PHILOSOPHICAL EGG, among chemiſts, a thin glaſs-body, or bubble, of the ſhape of an egg, with a long neck or ſtem, uſed in digeſtions.

PHILOSOPHY, φιλοσοφια, the knowledge or ſtudy of nature and morality, founded on reaſon and experience.

Philoſophy, among the antients, was uſed in various ſenſes: for, 1. It ſometimes was taken for univerſal knowledge, *viz.* of all things human and divine. 2. In a ſtricter notion, for the contemplation of nature only; and in this ſenſe a philoſopher was called by Plato φιλοσοφος φυσεως, *i. e.* a friend and lover of nature. 3. Sometimes for ethics, or the doctrine of manners, which we call moral philoſophy. 4. It included alſo the mathematical arts and diſcipline, eſpecially arithmetic and geometry. 5. The doctrine of exiſtence, or *being* in the abſtract, called metaphyſics. 6. For the knowledge του πρωτου καλου, *i. e.* of the prime or chief good, *viz.* God; and this was their prima philoſophia, or theology. 7. It was ſometimes applied to logics or dialectics, which gave rules for reaſoning about the nature of things. See the articles KNOWLEDGE, PHYSIOLOGY, and THEOLOGY.

Philoſophy may be divided into three parts, intellectual, moral, and phyſical. The intellectual part comprizes logics and metaphyſics; the moral part contains the laws of nature and nations; and, laſtly, the phyſical part comprehends the doctrine of bodies animate or inanimate. Theſe with their various ſubdiviſions, will take in the whole of philoſophy. See the articles LOGIC, METAPHYSICS, ETHICS, POLITICS, &c.

Wolfius makes the three parts of philoſophy to be the doctrine of God, the human ſoul, and of bodies: however, when he ſubdivides, and comes to treat of the ſeveral branches ſeparately, his diviſions readily come under the three heads, intellectual, moral, and phyſical, beforementioned.

For the method of philoſophizing, or the rules for that purpoſe, as eſtabliſhed by Sir Iſaac Newton, ſee the article EXPERIMENTAL PHILOSOPHY.

From the firſt broachers of new opinions, and the firſt founders of ſchools, philoſophy is become divided into innumerable ſects,

ſects, ſome antient, others modern; ſuch are the platoniſts, peripatetics, epicureans, ſtoics, pyrrhonians, and academics; and ſuch are the carteſians, newtonians, &c. See the riſe and doctrines of each ſect under its proper head, PLATONIC, PERIPATETIC, EPICUREAN, STOICS, PYRRHONIANS, ACADEMICS, CARTESIANS, NEWTONIAN, &c.

The cauſes of errors in antient philoſophy, or the reaſon why all former philoſophers have, through ſo many ages, erred, may, as delivered by lord Bacon and Mr. Locke, be ſeen under the article ERROR.

PHILTER, or FILTER, in pharmacy. See the article FILTER.

PHILTER, or PHILTRE, φιλτρον, is more particularly uſed for a love-potion, or medicine to excite love.

PHILTRATION, or FILTRATION. See the article CLARIFICATION.

PHILYCA, in botany, a genus of the pentandria-monogynia claſs of plants, the corolla whereof conſiſts of a ſingle, imperforated, erect petal, rude upon the outſide; the tube is of a conic form, and of the length of the perianthium; and the limb is quinquefid, erect, and ſmall; the fruit conſiſts of a roundiſh, trilobous, trilocular, and trivalvar capſule; and the ſeed is ſingle, roundiſh, gibbous on one ſide, and angulated on the other.

PHIMOSIS, in medicine, a diſorder of the penis, in which the prepuce is rendered ſo ſtrict or tenſe, that it cannot be drawn back over the glans.

The general cauſe of a phimoſis is, by phyſicians, rightly aſcribed to impure coition; for while the virulent matter, which had been lodged in the ſinuſes of the vagina, continues between the ſkin and glans, the prepuce, eſpecially if it be long or tight, can hardly eſcape being ſwelled with an inflammation, and a phimoſis muſt be induced. Some, however, have the foreſkin naturally ſo long, and ſo ſtraight, that the glans can either be not at all or very little uncovered; but as this neither occaſions trouble in diſcharging the urine, nor any impediment in procreation, it requires no aid from the ſurgeon, unleſs it be attended with inflammation, violent pain, or any remarkable inconvenience in coition. See the article GONORRHOEA.

If this diſorder is occaſioned by nó venereal taint, it may be ſufficient to bathe the penis, for ſome time, in warm water: but if it proceed from a venereal infection, proper internal medicines muſt be adminiſtered, and the other ſymptoms mitigated by waſhing out the virulent matter with a decoction of barley, mixed with honey of roſes, which muſt be frequently injected with a ſyringe between the ſkin and the glans. To diſcuſs the tumour, apply externally an emollient and digeſtive fomentation round the tumified part of the penis; and if the inflammation be ſevere, bleeding ſhould not be omitted. But if, after this, the prepuce cannot be drawn back, let the end of it be pulled as far forwards as poſſible, while an aſſiſtant holds the covered glans with his fingers; then let the ſurgeon, with his left thumb, preſs back the glans, covered with the ſkin, and with a knife, or ſciſſars, extirpate all that part of the prepuce which projects beyond his thumb, much in the ſame manner with the jewiſh circumciſion; after which, the ſkin may be eaſily drawn back, and the glans being uncovered, may be more expeditiouſly cleanſed and healed. Another method is, to divide with a pair of probe ſciſſars ſo much of the prepuce as will ſuffice to denudate the glans; and after this longitudinal inciſion, ſome ſurgeons cut off, with the ſciſſars, ſo much of the end of the prepuce as appears ſuperfluous. Theſe operations are uſually attended with a pretty plentiful hæmorrhage, which ſhould not be ſtopped by art, but rather permitted, according to the patient's ſtrength, in order to abate the inflammation: dreſs the wound with dry lint, and apply a proper compreſs and bandage; and proceed afterwards as in the cure of other wounds, taking care not to heal it too haſtily, nor too cloſely, leſt there ſhould be occaſion to repeat the operation.

PHLEBOTOMY, in ſurgery, the opening a vein with a proper ſharp-edged and pointed inſtrument of ſteel, in order to let out a proper quantity of blood, either for the preſervation or recovery of a perſon's health. See DISEASE.

Phlebotomy, or bleeding, appears to be not only one of the moſt uſeful, but one of the moſt antient operations in ſurgery, and is frequently performed in different parts of the body, as the foot, the forehead, temples, neck, tongue, penis, and other parts, yet is moſt generally performed in that vein of the inſide of the arm, which lies near the joint of the cubit, and therefore we ſhall begin with ſhewing the method of opening this vein. See VEIN.

The ſurgeon having tied on a fillet, about a hand's breadth above the bend of the

cubit; and the veins being compreſſed and enlarged, by the blood's being ſtopped in its return, he is to examine which vein lies faireſt, and is therefore moſt proper to be opened. In the arm are three principal veins; the firſt or uppermoſt of which is called the cephalic vein, the undermoſt the baſilic vein, and that in the middle the median. And here it is to be obſerved, that the median and baſilic veins, as they are larger than the cephalic, diſcharge a greater quantity of blood, but are attended with more danger in the operation; for a conſiderable artery and the brachial nerve lie under the baſilic vein, and the tendon of the biceps-muſcle under the median; but as they lie fairer to the eye, it is ſafer for the unexperienced ſurgeon to open the cephalic, or at leaſt the median vein; but ſometimes the veins are ſo ſituated as to deprive him of all choice. When the veins are not riſen, it will be proper to rub the arm below the bandage, to drive up the blood, and render the veins more turgid; while this is doing, the ſurgeon ſhould lay his thumb on the vein he intends to open, to prevent the blood from flowing back, and to keep the vein from rolling; and then holding the lancet, ſo that the thumb and firſt finger may be fixed about the middle of the blade, the other fingers ſhould reſt gently upon the patient's arm, to prevent his hand from ſlipping. The lancet is now to be puſhed ſlightly and carefully forward by the thumb and the fore-finger, till it has penetrated thro' the coats of the vein, and at that inſtant to be raiſed a little upwards in order to enlarge the orifice of the wound, and give a freer paſſage to the blood. When there ſeems to be a ſufficient quantity of blood diſcharged, the ligature muſt be immediately taken off, from above the elbow, and the ſkin about the orifice muſt be gently preſſed together by which means the lips of the divided vein are eaſily cloſed, and the little blood that may remain between the orifice and the vein diſcharged: one or two compreſſes are then put on, which the ſurgeon preſſes gently on the orifice with his left thumb, till the bandage is laid acroſs it, which is afterwards faſtened by turning it round the arm, both above and below the elbow, and tying both together.

In bleeding in the foot, it muſt be obſerved, that the veins proper for this operation, are the ſaphena and cephalica, the laſt of which extends itſelf from the internal ancle to the great toe; and the firſt, from the external malleolus to the ſmaller toes: bleeding in each of which is attended with the ſame effect: but if the veins upon the metatarſus, or inſtep, do not fully appear, it may be convenient to open one of thoſe at the ancle, or about the calf or ham of the leg, where the phlebotomiſt is not ſo liable to injure any of the tendons, as in the metatarſus. For the more eaſy apertion of theſe veins, the patient muſt firſt waſh both feet in warm water; and the ſurgeon having fixed upon the particular foot and vein, which appears moſt turgid, he applies a ligature about two fingers breadth, above the ancle, or where he intends to open the vein, and puts it in the warm water again, while he takes out his lancet. Then kneeling down on one knee, he takes out the foot, and, it being wiped dry, places it on the other knee, or upon a board laid over the veſſel of warm water, and, ſecuring the vein from ſlipping with the thumb of his left hand, makes the orifice; but if the patient does not bleed freely, puts the foot again in the warm water, till he judges, by its colour, and the ſtrength of the patient, that a ſufficient quantity of blood has been drawn; the orifice is then to be cloſed by the thumbs, and, after drying the foot with a napkin, to be ſecured by compreſſes and a bandage.

In bleeding in the jugular veins of the neck, a ſtricture muſt be made round the lower part of the neck, with a neck-cloth or handkerchief, or the common ligature, to make the vein turgid or conſpicuous, and then either of the jugular veins being ſecured by the thumb, the inciſion muſt be made, and, the requiſite quantity of blood being taken away, the ligature muſt be removed, and the orifice compreſſed with the thumb, if the blood does not ſtop without, while the neck is wiped clean, after which the compreſs and circular bandage muſt be applied. It is to be obſerved, that if the diſorder lies in the whole head, or in the neck and fauces, the orifice may be made either in the right or left ſide indifferently; but when only one ſide of the head, or one eye is affected, the vein ought to be opened on that ſide in which the diſorder lies.

In bleeding in the veins of the forehead, temples, and occiput, a ſtricture muſt be made round the neck, and the ſame method uſed as in opening the jugular veins; only obſerving that the patient muſt

muſt hold down his head, to prevent the blood trickling into his eyes, &c.

In bleeding in the veins called ranulæ under the tongue, a ſtricture muſt be made round the neck, as before; you then elevate the apex of the tongue with your left hand, while with the lancet in your right hand, you circumſpectly open firſt one, and then the other on each ſide; becauſe the apertion of one only will hardly ever diſcharge blood enough to give any conſiderable relief. When you judge that a ſufficient quantity of blood has run out of the mouth into the veſſel, remove the ligature from the neck, upon which the flux uſually ſtops of itſelf; but if it ſhould ſtill continue, let the patient take a little vinegar or frontiniac wine in his mouth, and hold it there till the hæmorrhage ceaſes, which cannot be dangerous, even without ſuch topics.

In bleeding in the vena dorſalis penis, which runs along the upper ſide of the penis, and is generally pretty much diſtended, and conſpicuous in an inflammation of this part, it is to be obſerved that it muſt be opened about the middle, and kept bleeding till the member becomes flaccid, and a ſufficient quantity of blood is diſcharged; which done, you muſt apply a compreſs, and the bandage proper for the penis. But you muſt carefully endeavour to avoid injuring the arteries or nerves, which enter the penis near this vein; as alſo not to make your bandage too ſtrict; for by this means, the inflammation and ſymptoms may turn out worſe than before.

In bleeding in the eyes, there are ſeveral ways of performing the operation, but the beſt, in Heiſter's opinion, is the following. The patient being ſeated on a chair, and his head held in a proper poſture, a tranſverſe inciſion is to be made, with a fine lancet, upon the turgid ſmall veins in the corners of the eye, ſo as to open them or cut them quite aſunder. The eye-lids muſt be held apart with one hand, whilſt the veins are opened with the other; and ſome uſe a pair of fine ſciſſars for this purpoſe, inſtead of a lancet, and others elevate the veins with a crooked needle before they divide them; but in this operation the better way would be to make the needles with edges, that when the veins were thus elevated, they might divide them without the help of any other inſtrument. When the inciſion is made, the diſcharge of blood muſt be promoted by means of fomentation, with a ſpunge dipped in warm water; and if the diſcharge is not ſufficient, the inciſion may be repeated two or three times: but few patients can be brought to ſuffer this, and there is no practiſing it at all upon infants, becauſe they will not keep the eye ſteady.

For the uſe of leeches in bleeding, ſee the article LEECH.

PHLEGM, φλεγμα, in the animal oeconomy, one of the four humours whereof the antients ſuppoſed the blood to be compoſed. See the article BLOOD.

The chemiſts make phlegm, or water, an elementary body, the characters of which are fluidity, inſipidity, and volatility: and yet quickſilver has all theſe, which nobody pretends to be phlegm. See the article WATER.

The phlegm of vitriol, Mr. Boyle obſerves, is an effectual remedy againſt burns, and excellent for diſcuſſing hard tumours: that of vinegar will extract a ſaccharine ſweetneſs from lead, and even diſſolve corals by long digeſtion: that of ſugar of lead is ſaid to diſſolve pearls. Phlegm, or an inſipid water, always comes out firſt in diſtillations; however, it is doubted, whether even repeated diſtillations can obtain it perfectly free from all other mixtures, or altogether devoid of ſmell and taſte.

PHLEGMAGOGUES, in pharmacy, ſuch medicines as purge off phlegm: ſuch are hermodactyls, agaric, turbith, jalap, &c. See the article HYDRAGOGUES.

PHLEGMATIC, among phyſicians, an appellation given to that temperament, or habit of the body, wherein phlegm is predominant; which gives riſe to catarrhs, coughs, &c. See the articles CATARRH and COUGH.

PHLEGMON, in ſurgery, denotes an external inflammation and tumour, attended with a burning heat, &c. See the article INFLAMMATION.

PHLEUM, in botany, a genus of the triandria-digynia claſs of plants, the corolla of which conſiſts of two valves; and the ſeed, which is ſingle, is included within the calyx and corolla.

PHLOGIDIAUGIA, a claſs of foſſils, the characters of which are, that the bodies comprehended in it are tranſparent and inflammable: ſuch are ſulphur, orpiment, zarnich, and amber. See the articles SULPHUR, ORPIMENT, &c.

PHLOGISCIERIA, another claſs of foſſils, which are inflammable bodies of a coarſer and more impure texture, and not

not pellucid: ſuch are ambergreaſe, jet, aſphalta, ampelites, and lithanthrax. See AMBERGREASE, JET, &c.

PHLOGONIÆ, a claſs of compound, inflammable, and metallic foſſils, found in ſmall maſſes of determinately angular figures; comprehending the pyricubia, pyroctogonia, and pyripolygonia.

PHLOGOSIS, a ſmall inflammation of the eye. See the article OPHTHALMIA.

PHLOMIS, SAGE-MULLEIN, in botany, a genus of the didynamia-gymnoſpermia claſs of plants, the flower of which is monopetalous and ringent, and its four triquetrous ſeeds are contained in the bottom of the cup. Its leaves are accounted aſtringent and vulnerary.

PHLOX, in botany, a genus of the pentandria-monogynia claſs of plants, the corolla whereof conſiſts of a ſingle hypocrateriform petal; the tube is cylindric and three times the length of the cup, narrow below, and crooked; the limb is plain, and divided into five roundiſh, equal, obtuſe ſegments, ſhorter than the tube: the fruit is an oval, but ſomewhat trigonal capſule, formed of three valves, and containing three cells: the ſeeds are ſingle and oval.

PHLYACOGRAPHIA, among the antients, a merry and burleſque imitation of ſome grave and ſerious piece, particularly a tragedy traveſtied into a comedy; being the ſame with the hilarody or hilarotragedy.

PHLYCTÆNÆ, in medicine, ſmall eruptions on the ſkin, ariſing from an hot or acrimonious humour. Hippocrates ſometimes repreſents them as reſembling thoſe puſtles which appear after ambuſtions.

PHLYSTÆNA, in medicine, a diſeaſe which produces buboes or tumours full of a ſerous humour.

PHLYZATION, in medicine, a puſtle or inflammation of the ſkin, or the bliſter ariſing from being burnt or ſcalded with hot liquor.

PHOCA, the SEA CALF, in zoology, a genus of quadrupeds of the order of the feræ: the fore-teeth in the upper jaw are ſix, thoſe in the under jaw are only four: the feet have each five toes, and are palmated, and made for ſwimming: there are no ears.

This is a very ſingular and extraordinary animal, as ſeeming in ſome degree to connect the quadruped and the fiſh-kind: the common phoca grows to five feet or more in length: the whole body is covered with a fur, of a mixed greyiſh and yellowiſh colour; the creature is contrived for living a great part of its time under water: the foramen ovale of the heart being to this purpoſe continued open in it, as it is in a fœtus, which is to live without the aſſiſtance of breathing.

PHOCEA, a city of Oeolis, on the weſt coaſt of the leſſer Aſia, antiently ſo called. Phocea, or Phocis, was alſo a ſubdiviſion of Achaia, in the ancient Greece, now a part of Livadia in european Turky.

PHOENICOPTERUS, or FLAMINGO, in ornithology, a genus of birds, of the order of the anſeres, of which there is only one known ſpecies; its beak is bent in ſuch a manner as to appear broken, and is dentated at the edges. It is one of the moſt ſingular birds in the world, with an extremely long neck, and ſtill longer legs, in proportion to the ſize of its body: the covering feathers of its wings are all of the higheſt ſcarlet, and make a moſt glowing appearance; whence the name. See plate CXCIX. fig. 2.

PHOENIGMUS, in pharmacy, a medicine which produces redneſs with bliſters on the part to which it is applied. Such are muſtard-ſeed, pepper, veſicatories, &c. Theſe medicines are uſed to draw the humours to the part they are applied to, and to divert it from the part affected.

PHOENIX, in aſtronomy, one of the conſtellations of the ſouthern hemiſphere, unknown to the antients, and inviſible in our northern parts. This conſtellation is ſaid to conſiſt of thirteen ſtars. It took its name from that of a bird famous among the antients, but generally looked upon by the moderns as fabulous. The antients ſpeak of this bird as ſingle, or the only one of its kind: they deſcribe it as of the ſize of an eagle; its head finely creſted with a beautiful plumage, its neck covered with feathers of a gold colour, and the reſt of its body purple, only the tail white, and the eyes ſparkling like ſtars; they hold that it lives five or ſix hundred years in the wilderneſs; that when thus advanced in age, it builds itſelf a pile of ſweet wood and aromatic gums, and fires it with the wafting of its wings, and thus burns itſelf; and that from its aſhes ariſes a worm, which in time grows up to be a phoenix.

PHOENIX, the GREAT PALM, or DATE-TREE, in botany, a genus of plants, the characters of which are not yet perfectly aſcertained: the male and female flowers

are

Fig. 1. PICA

Fig. 2. PHŒNICOPTERUS or *FLAMINGO*.

Fig. 3. PLATANUS, the *PLANE-TREE*.

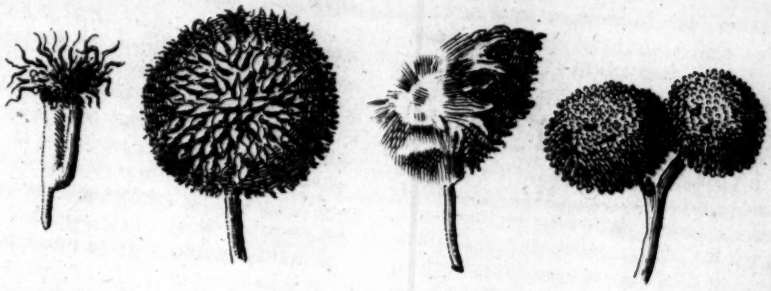
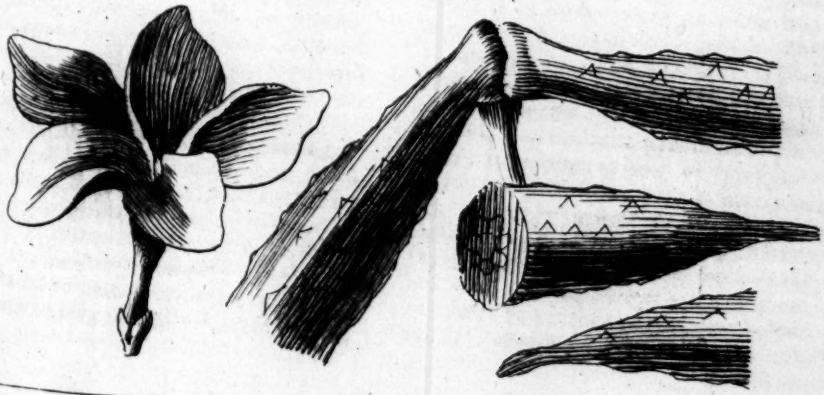


Fig. 5. PLUMERIA.



T. Jefferys sculp

BRITISH MUSEUM

are on diſtinct plants, or on the ſame ſpadix. In the male flowers the general ſpatha is compoſite; the ſpadix is ramoſe; the corolla is deeply divided into three hollow oval ſegments; the ſtamina are three ſlender filaments. In the female flowers the calyx is the ſame as in the male; the corolla is divided into three principal ſegments, with as many very ſmall laciniæ: the fruit is an oval berry, having only one cell, and in that a ſingle oſſeous ſeed, of a ſub-oval figure, with a longitudinal furrow.

PHOLAS, a ſhell-fiſh of the multivalve-kind, compoſed of five pieces, three of which are very ſmall, ſo that they ſeem to a ſuperficial obſerver to be made up of only two ſhells.

The animal inhabiting the pholas is called tethys. They inhabit holes made in ſtones and other ſolid bodies, as corals, the bottoms of ſhips, &c. whence all ſhell-fiſh living in this manner have been commonly called pholades, ſince there are muſcles and chamæ found lodged in the ſame manner.

PHOLIS, in natural hiſtory, a name given to the gypſums of a bright appearance.

PHONICS, φωνιχη, the doctrine or ſcience of ſounds, otherwiſe called acouſtics. See the article SOUND.

Phonics may be conſidered as analogous to optics, and divided like that into direct, refracted, and reflected, as phonics, diaphonics, and cataphonics.

As to the object of phonics, ſound may be improved both with regard to the begetting, as in ſpeaking, whiſtling, ſinging, hollowing, &c. and with regard to its propagation by the poſition of the ſonorous body.

With regard to the medium, phonics may be improved by the thinneſs and quieſcency thereof, and by the ſonorous body being placed near a ſmooth wall, either plane or arched, eſpecially cycloidal or elliptical; whence the theory of whiſpering-places: as alſo by placing the ſonorous body near water, its ſound is mollified; and, on a plain, the ſound is conveyed to a greater diſtance than on uneven ground, &c.

As to the ear, it is helped by placing it near a wall, eſpecially at one end of an arch, the ſound beginning at the other, or near the ſurface of water or the earth; and by inſtruments, as the ſtentorophonicon or ſpeaking-trumpet; alſo by an inſtrument to help weak ears, by an inſtrument to take in vaſtly remote ſounds, by a microphone, and by a pholyphone. Cataphonics may be improved by ſeveral kinds of artificial echos. See the article HEARING.

PHORBÆA, or PHORBEIA, in the muſic of the antients, a name given to a ſort of frenum or bandage applied to the mouths of people who played on the pipe; being a ſort of leather band which went acroſs the forehead, then behind each ear, and then, making one or two turns round the head, it paſſed over the mouth, where its office was to reſtrain the lips from emitting too much breath at once, and cauſe them to diſcharge only juſt as much as would ſerve to inflate the pipe.

PHOSPHORUS, in phyſiology, a denomination given to all bodies which ſhine and ſeem to burn, without having any degree of heat.

That theſe bodies owe their lucidity to the motion of the parts, ſeems evident for the following reaſons: 1. Several phoſphori are undoubtedly owing to putrefaction, as rotten wood, very ſtale meat, eſpecially veal, ſome ſorts of fiſh long kept, as oyſters, lobſters, flounders, whitings, &c. which putrefaction is the effect of a ſlow and gentle fermentation, or inteſtine motion of the parts. 2. Moſt phoſphori have their light ſo weak as to ſhine only in the dark, which ſeems to argue a leſſer degree of velocity in the parts, than what is neceſſary to produce heat; becauſe this laſt degree of velocity will cauſe bodies to ſhine in open day-light. 3. Some phoſphori are the parts of animated bodies, as the cicindela or glow-worm; but all the parts of an animal are undoubtedly in motion. 4. Other phoſphori put on the appearance of flame, as the ignis fatuus, the writing of common phoſphorus made from urine, flaſhes of lightening, &c. but all flame is nothing but a kindled vapour, whoſe parts are all in motion, which may be too weak to cauſe burning, or even a ſenſible degree of heat. 5. Several of thoſe innocent lambent flames may have their matter ſo agitated, or the velocity of their motion ſo increaſed, as actually to produce heat, and burn: thus, the writing of phoſphorus on blue paper, ſufficiently rubbed, will kindle into an ardent flame, and burn the paper. 6. Phoſphori ſeem to have the eſſential nature of fire, becauſe they are ſo eaſily ſuſceptible of a burning quality from fire: thus, common phoſphorus is immediately kindled into a moſt ardent

ardent and inextinguiſhable flame, by common fire. 7. By ſtroking the back of a black horſe, or cat, in the dark, we produce innumerable ſcintillæ, or lucid ſparks; in the ſame manner, the rubbing a piece of black cloth, which has hung in the ſun to dry, will cauſe it to throw out the particles of light which it had imbibed from the ſun; whereas, a white piece of cloth, which reflects moſt of the ſun's rays, emits no ſuch lucid ſparks in the dark.

Many other reaſons might be urged to ſhew, that light of every kind is owing to one and the ſame cauſe in a greater or leſſer degree, *viz.* the velocity of the parts of the lucid body.

Phoſphori in general, ſays Lemeri, may be conſidered as ſo many ſpunges full of the matter of light, which is ſo ſlightly retained therein, that a ſmall external force is ſufficient to put it in motion, and cauſe it to exhale in a lucid form: thus the phoſphori made of human urine, and other chemical preparations, receive ſo large a proportion of fire in their preparation, and retain it ſo well in their unctuous ſubſtance, that it may be kept there, in water, for twenty years; ſo as upon the firſt laying them open to the air, they ſhall take fire, and exhale in lucid flames. Not that the fire is ſuppoſed to be fixed and quieſcent all the while in the body of the phoſphorus; for that it has a real motion all the time is evident hence, that it is ſeen in any dark place, in the ſummer-ſeaſon, fulminating and emitting flaſhes (though, with all this, it ſcarce loſes any thing of the fire) ſo that the fire is not fixed in the phoſphorus, but in a continual undulatory motion.

Chemiſtry, ſays Dr. Shaw, hath ſcarce afforded any thing more ſurpriſing than the common phoſphorus. To ſee letters traced with this matter become luminous in the dark, images and the bodies of men to blaze with light, and abundance of the like experiments, performed by means of phoſphorus, muſt awaken the curioſity of thoſe who have ſeen theſe experiments, and render them deſirous of being acquainted with the method of preparing it. The preparation, even to this day, is kept as a ſecret in few hands, and the matter ſold at a very great price. Whence we apprehend it would be no unacceptable preſent to the world, to render this commodity cheaper, and diſcover its farther uſes.

The ſucceſsful method of preparing the phoſphorus of urine is this: evaporate any quantity of freſh urine over a gentle fire, to a black and almoſt dry ſubſtance; then, with two pounds thereof, thoroughly mix twice its weight of fine ſand; put this mixture into a ſtrong coated ſtone long-neck; and having poured a quart or two of clear water into a large receiver, join it to the long-neck, and work it in a naked fire: let the heat be ſmall for the firſt two hours; then increaſe it gradually to the utmoſt violence: and continue this for three or four hours ſucceſſively: at the expiration of which time, there will paſs into the receiver a little phlegm and volatile ſalt, much black and fœtid oil, and, laſtly, the matter of phoſphorus, in form of white clouds, which either ſtick to the ſides of the receiver, like a fine yellow ſkin, or fall to the bottom in form of ſmall ſand. Now let the fire go out, but let the receiver continue till all be cold, leſt the phoſphorus take fire on the admiſſion of the air. To reduce theſe ſmall grains into one piece, put them into a little tin ingot-mould, with water; heat the ingot to make the grains melt together; then add cold water, till the matter is congealed into one ſolid ſtick, like bees-wax; which being cut into ſmall pieces, fit to enter the mouth of a vial, may be preſerved by water, and keeping the glaſs cloſe ſtopped. If the glaſs were not to be ſtopped, the phoſphorus would turn black on its ſurface, and at length be ſpoiled.

The cautions required to make this proceſs ſucceed, are, 1. To evaporate the urine, while it is recent. 2. To prevent its boiling over, and by that means loſing the moſt unctuous part. 3. To let the matter afterwards ferment in the cold. 4. To mix the black matter with the ſand, to prevent its melting and running over. 5. To uſe a ſtone long-neck, thoſe of earth being too porous, and ſuffering the phoſphorus to tranſude ſooner, than paſs into the receiver. 6. To have the receiver very large, and with a very long neck, to prevent its breaking and over-heating, which would either evaporate the white vapour wherein the phoſphorus conſiſts, or elſe prevent its coagulating. 7. To put water into the receiver, for keeping it cool, and quenching the phoſphorus, as it falls to the bottom. 8. To make the fire ſmall at firſt, that the long neck may be preſerved

ſerved, and the black matter gradually dried; which would otherwiſe ſwell, and run over in a black froth. 9. Laſtly, it is found neceſſary, that the urine for the operation be of ſuch as drink malt-liquors, rather than wine. All theſe circumſtances being required for obtaining the phoſphorus to advantage, it is no wonder that ſo many of thoſe who attempted it, miſcarried.

This operation may be greatly ſhortened, by freezing and concentrating freſh urine; afterwards evaporating it with care; then digeſting it in the manner above-mentioned. When thoroughly digeſted, commit the matter, in a large quantity, to an iron-pot, with an earthen head, as the chemiſts uſually do for making ſpirit of hartſhorn, or the ſpirit and ſalt of urine; and when, by this method, all the ſalt and oil are obtained, let the caput mortuum be taken out, and mixed with twice its own weight of alum. The matter may now be put into well-coated long-necks, and worked with care in a reverberatory furnace, into very large receivers filled with water, and connected to the long-necks by adopters, the lower ends whereof may enter the water, as in diſtilling of quick-ſilver; the operation being continued eight or ten hours. And this is apprehended to be the beſt way, hitherto known, of procuring phoſphorus to advantage.

This phoſphorus has been ſeveral ways diſguiſed, ſo as to make it appear under various forms; ſometimes as a ſolid, ſometimes as a liquid, ſometimes as an ointment, and ſometimes as a running mercury.

Dr. Wall informs us, that Mr. Boyle, being concerned to find how ſmall a proportion of phoſphorus was afforded by urine, deſired him to look out for another ſubject that might afford it in greater plenty. The doctor afterwards cauſing a piece of dry matter to be dug up in the fields where night-men emptied their carts, he obſerved a great number of ſmall particles of phoſphorus therein. This matter the doctor immediately carried to Mr. Boyle, who ſet Bilgar, the chemiſt, to work upon it; but he could obtain very little phoſphorus from it, till another material was added to it in diſtillation; and then he procured phoſphorus in ſuch plenty, that, ſelling large quantities at ſix guineas the ounce, he ſoon became rich, and left England.

The matter which thus fixes and increaſes the phoſphorus is apprehended to be alum, which is itſelf not only in ſome meaſure prepared from urine, but appears to afford the ſame kind of acid that phoſphorus yields by burning; for, upon its analyſis, phoſphorus appears to be a compoſition of a ſtrong acid and inflammable matter, exactly in the manner of common brimſtone, whence it may not improperly be called an animal ſulphur: and accordingly, like common brimſtone, it will burn under a glaſs-bell, and afford flowers that become an acid liquor, like oleum ſulphuris per campanam, by attracting the moiſture of the air.

This phoſphorus has been employed for making curious experiments, a few whereof we ſhall here exhibit, from Dr. Shaw. 1. The light of this phoſphorus appears greater in vacuo than in the open air. 2. In hot weather it is obſerved to dart flaſhes of light through the water wherein it is contained, ſo as exactly to reſemble lightning; which thus darts unextinguiſhed through watery clouds and vapours. 3. Theſe flaſhes of light are not apt to kindle or burn any combuſtible matter, in which they reſemble the harmleſs kind of lightening; but in a condenſed ſtate this phoſphorus burns very furiouſly, and with a moſt penetrating fire, ſo as to melt and diſſolve metals: in which reſpect it again reſembles the more deſtructive kinds of lightening, which are found to have the ſame effects. 4. If a little piece of this phoſphorus be viewed through a microſcope, the internal parts appear in a conſtant ebullition. 5. Though this phoſphorus appears to be a kind of ſulphur, yet it does not diſſolve in highly rectified ſpirit of wine, but communicates ſome ſulphureous parts thereto; for, if this ſpirit be poured into water in the dark, it yields a faint degree of light. 6. This phoſphorus, being mixed with a large quantity of pomatum, makes a ſhining unguent, which may be rubbed on the hands and face, without danger of burning, ſo as to render them luminous in the dark.

Many other ſurpriſing experiments may be made with this phoſphorus, which is a ſubſtance that ſeems in chemiſtry to be much ſuch a thing as the loadſtone in natural philoſophy; and its effects almoſt as odd and difficult to explain, for want of knowing the latent properties of bodies

There are other different kinds of artificial phoſphori, of which we ſhall only mention two, diſcovered by Mr. Homberg. The firſt is that uſually called the black phoſphorus, now commonly prepared with alum and wheat flour (five parts of the former to one of the latter) calcined together to a browniſh or blackiſh maſs; which being powdered and ſet in a phial looſely ſtopped, in a ſand-heat, ſo as to continue glowing for ſome time; then removing the whole from the fire, and ſuffering it to cool gradually, and at laſt ſtopping the bottle cloſe, it ſhould be kept in a dark and dry place. A little of this powder being expoſed to the open air, immediately takes fire, and appears like a glowing coal: and it is remarkable, that it may be made of any animal or vegetable ſubſtance, inſtead of wheat flour; but that no ſalt can be ſubſtituted inſtead of alum.

Mr. Homberg's other phoſphorus is made of one part of ſal ammoniac, and two parts of lime, ſlaked in the air; mix theſe well together, and fill a ſmall crucible with them; ſet this in a ſmall fire of fuſion, and as ſoon as the crucible is red hot, the mixture will melt, and ſhould be ſtirred with an iron rod to prevent its running over. When the matter is entirely fuſed, pour it into a braſs-mortar, and when cool it will appear of a grey colour, and as if vitrified; if now it be ſtruck upon with any hard body, it appears as on fire in the whole extent of the ſtroke; but the matter being brittle, it is proper for the experiment's ſake, to dip little bars of iron or copper into the melted matter in the crucible; for thus they will be enamelled as it were with the matter, and theſe bars being ſtruck upon will give the ſame fire, and the experiment may be ſeveral times repeated before all the matter falls off. Theſe bars muſt be kept in a dry place, to prevent the phoſphorus upon them from running, by the moiſture of the air.

Both theſe phoſphori were diſcovered by accident; the firſt, in ſearching for a limpid oil from the common ſtercoracious matter that ſhould fix quickſilver; and the ſecond, by endeavouring to calcine ſal ammoniac with lime, ſo as to render it fuſible like wax; which end was obtained, but not the other.

PHOTINIANS, a ſect of chriſtians in the fourth century, ſo called from Photinus, their chief, who was biſhop of Sirmich, and maintained that Jeſus Chriſt was true man, but not true God, nor born before all ages; and that he only began to be Chriſt when the Holy Spirit deſcended upon him in the river Jordan. Theſe doctrines were condemned in ſeveral aſſemblies, and particularly by the Arians, in a ſynod held at Sirmich in the year 351.

PHRASE, φρασις, in grammar, a manner of ſpeech peculiarly adapted to certain occaſions, arts, languages, &c.

Sometimes the term phraſe is uſed for a ſhort ſentence. See SENTENCE.

PHRASEOLOGY, in matters of literature, a collection of the phraſes, and elegant expreſſions, in any language.

PHRENES, φρενες, in anatomy, the name by which Hippocrates, and the antient phyſicians, called the diaphragm, as ſuppoſing it to be the ſeat of the rational ſoul. See the article DIAPHRAGM.

PHRENETIC VESSELS, in anatomy, the nerves, arteries, and veins which are ſpread over the diaphragm. The phrenetic nerves ariſe from the cervical ones; the phrenetic arteries ariſe out of the deſcending aorta, and are diſtributed thro' the diaphragm and pericardium; and the two phrenetic veins diſcharge their contents into the vena cava.

PHRENITIS, or PHRENSY, in medicine. See the next article.

PHRENSY, φρενιτις, in medicine, an inflammation of the membranes of the brain, attended with an acute fever and delirium.

A primary phrenſy is preceded by heat, and a violent inflammatory pain within the head, a redneſs of the eyes and face, unquiet and troubled ſleep, a ſlight degree of folly, watching, ſadneſs, fierceneſs, ſudden forgetfulneſs, and a gathering of threads from the bed-cloaths: whereas a ſymptomatic phrenſy ſucceeds any acute diſeaſe, but is worſt when preceded by an inflammation of the pleura, lungs, or diaphragm.

A black tongue, an obſtinate coſtiveneſs, white fæces (which is always a fatal ſign) a wildneſs in the looks and actions, &c. are ſigns of an approaching phrenſy; which is generally fatal on the third, fourth, or ſeventh day, which laſt it ſeldom exceeds: when it does, and is violent, the patient becomes raving mad; and it often terminates in a lethargy, coma, or catoche.

This diſeaſe, ſays Arbuthnot, requires the ſpeedieſt applications of all others; profuſe

profuſe hæmorrhages of the noſe often reſolve it; and copious bleeding in the temporal arteries, is the moſt efficacious remedy. The diet ſhould be water-gruel, acidulated; and the drink barley-water, ſmall-beer, or the decoction of tamarinds.

According to Boerhaave, varices of the veins, or the bleeding-piles, are beneficial: a looſeneſs is likewiſe good; and a violent cough, or hæmorrhage, often put an end to the diſeaſe. He therefore adviſes plentiful bleeding, through a large orifice, or to open ſeveral veins at the ſame time, as the jugular, frontal, and a vein in the foot.

Hoffman, from experience, prefers bleeding at the noſe, procured by thruſting up a ſtraw, a pen, or a ſkewer. But if this diſeaſe proceeds from a ſuppreſſion of the lochia or menſes, ſpeedy and copious bleeding in the foot is neceſſary: and if from a ſtoppage of the bleeding piles, leeches muſt be applied to the hæmorrhoidal veins. After bleeding, cathartics are proper; among which, the following is preferable to all others: take of manna, four ounces; of cream of tartar, two drams; of nitre, half a dram; of oil of ſweet almonds, an ounce: all which are to be taken in a pound of whey. The drink alſo ſhould be freſh whey. Emulſions of the four cold ſeeds with barley-water, adding to every quart two ſcruples of nitre, are alſo convenient.

Externally, warm baths are proper for the feet; or linen-cloths may be dipped in hot-water, and applied to the feet. But eſpecially let the head be ſhaved all over, and embrocated with a mixture of the beſt vinegar, two ounces; camphorated ſpirit of wine, two drams; purified nitre, two ſcruples; and oil of rhodium-wood, twenty drops. Antiphlogiſtic clyſters are alſo proper.

But if all theſe means fail, recourſe muſt be had to cupping in the lower parts, to opiates and mild bliſters: though Hoffman thinks the two latter hurtful; and Boerhaave adviſes the phyſician to conſider well, if the caſe be ſymptomatical, how far the foregoing method, or any part of it, is conſiſtent with the primary diſeaſe.

PHRYGANEA, in zoology, a genus of inſects of the order of the neuroptera, the palate whereof is prominent, with two tentacula on each ſide; the wings are incumbent; and the worm of it lives under water in a kind of caſe.

PHRYGIA, the Greater and Leſſer, two provinces antiently of Aſia Minor; having the Helleſpont on the north.

PHTHIRIASIS, φθειριασις, in medicine, the pedicularis morbus, or louſy diſeaſe, is moſt incident to children, though adults are not wholly exempt from it.

Cleanneſs and wholeſome food are beſt for preventing this diſorder, which may be cured by waſhing the body with a lixivium of wormwood, ſtaves-acre, leſſer centaury, and oak-aſhes; adding ſome common ſalt. All the bitters, ſour and ſalt things, are here recommended; as is alſo mercury, which infallibly deſtroys theſe vermin; but it ought to be uſed with great caution, even by adults, and ſhould never be uſed in applications to children.

Etmuller adviſes the head to be waſhed with a lixivium, in which has been boiled the ſeeds of ſtaves-acre, and afterwards anointed with a liniment made of two drams of oil of ſpike, half an ounce of the oil of bitter-almonds, and ſix drams of the oil of tobacco, which will deſtroy thoſe animals in one night's time. The powder of indian-berries, ſprinkled on the head, alſo effectually deſtroys them. Black ſoap is an infallible remedy for deſtroying crab-lice lodged in the groins of adults.

PHTHISIS, φθισις, a ſpecies of conſumption, ariſing from an ulcer of the lungs. See the article CONSUMPTION.

The ſign of an approaching phthiſis, according to Morton, is a dry cough, which may continue for ſome months; whereas a ſimple catarrh is attended with ſpitting, and is but of ſhort duration. Vomiting, or a diſpoſition to vomit after eating, excited by the above-mentioned cough, is a moſt certain ſign of a phthiſis.

The effects of an ulcer of the lungs already formed, but concealed under the name of a vomica, are chiefly theſe; a purulent conſumption of the whole lungs, or one of its lobes; a continual dry cough; the burſting of the vomica; the ſometimes ſuffocating diſcharge of the pus, or the daily coughing up of matter, which ſinks in water, and is thick, fœtid, white, red, yellow, livid, or ſtreaked; and which, put into the fire, has the ſmell of burnt fleſh. Sometimes the vomica breaks into the cavity of the

thorax, which is what phyſicians call an empyema. See EMPYEMA.

If the purulent matter is allowed to enter the blood, the reſpiration becomes exceeding bad; the chyle, and the whole maſs of blood, are converted into pus; the uſual method of nouriſhment is deſtroyed; the ſolids continually waſte away; a hectic fever appears, with nocturnal ſweats, ſwelling of the feet and hands, and diarrhœa of purulent cadaverous ſtools, which generally end in death.

As to the cure, Boerhaave's method is this: when a vomica is known to be formed in the lungs, the phyſician muſt endeavour to ripen it, which is done by a milk diet, riding on horſe-back, warm vapours, and expectorant medicines. The blood muſt be defended againſt the purulent infection, by moderately acid and ſaltiſh remedies, vulnerary herbs, and balſamics, given in various forms, in great plenty, and continued a long time. The ulcer muſt be cleanſed and healed by liquid medicines, and ſuch things as promote coughing, by motion, riding, and good air. The cleanſers are detergent balſamics, uſed inwardly and outwardly; and the conſolidaters are paregorics. The aliment ſhould be eaſy of digeſtion: butter-milk is excellent; as are alſo aſſes-milk, ptiſans, broths and lacticinia.

Sydenham adviſes, at firſt, bleeding and gentle purging, to diminiſh the defluxion on the lungs; then pectorals, and ſuch medicines as temperate the hectic fever, with emulſions, and aſſes-milk. See the article HECTIC.

And, laſtly, he directs the ulcer to be healed with balſamics, as opobalſamum, the doſe being twenty drops upon ſugar; but this is not to be taken before due evacuations have been firſt made: but, above all, he recommends riding; which, he ſays, as certainly cures a conſumption, as the peruvian bark does intermitting fevers.

But as conſumptions are ſo common as to make above a tenth part of the bills of mortality in London, we ſhall give Morton's method of treating them. In the firſt ſtage, when the perſon is afflicted with a continual cough, eſpecially in the night time, the defluxion upon the lungs is to be ſtopped by bleeding, by repeated draughts of oxymel of ſquills and oil of ſweet-almonds, of each an ounce, to be taken in large draughts of poſſet-drink; after which an opiate, made of two ounces of the ſimple alexiterial water, half an ounce of ſimple cinnamon-water, and ſix drams of the ſyrup of poppies will be proper; or the patient may take ſix or ten of the ſtorax-pills. It will alſo be convenient to carry down the impurities by ſtool, with a gentle cathartic. Diaphoretics likewiſe are not to be neglected; nor muſt thoſe remedies that ſoften, lubricate, thicken, and concoct the phlegm be omitted; as ſugar-candy, barley-ſugar, old conſerve of roſes, liquorice-juice, the white and black troches of the London-diſpenſatory, freſh-butter in water-gruel, ſweet oil, oil of ſweet-almonds, and eſpecially linſeed-oil cold drawn, of which the patient may take a ſpoonful every hour, unleſs there is a diarrhœa, or other ſymptom that forbids it. He may alſo eat raiſins and figs, and uſe the other medicines commonly preſcribed for coughs. See the article COUGH.

In the ſecond ſtage, when the vomica is formed, but not ſuppurated, evacuations of all kinds are pernicious. The patient ſhould continue the uſe of the pectoral medicines, and eſpecially the balſamic pills, milk-diet, and the chalybeate-waters; of which he ſhould drink only four, or at moſt ſix pints in a day, and a little at a time: and this courſe ſhould be continued for ſeveral years.

But whether a milk-diet be uſed alone, or mixed with mineral-waters, Hoffman thinks it highly neceſſary to attend to the following particulars: 1. We ought diligently to enquire whether the ſtrength of the ſtomach is ſufficient to digeſt and again expel this ſpecies of medicine. 2. It is expedient that, before the uſe of the milk, the primæ viæ ſhould be well cleanſed from viſcid and acid humours; which intention is moſt effectually anſwered by a laxative infuſion of manna, whoſe virtue is augmented by adding a ſufficient quantity of tartar. 3. On the firſt days, it is expedient every morning about ſix or ſeven, and every afternoon, about five o'clock, to drink ſix or eight ounces of women's or aſſes-milk, and afterwards gradually to increaſe the quantity. 4. After the patient has for ſix or eight days drank the milk in this manner, a gentle laxative medicine, and ſuch as has a tendency to evacuate the ſordes, is to be interpoſed and repeated every ſixth day. 5. He ought never to uſe wine or malt-liquors for drink, but rather

rather ptiſans of barley, hartſhorn, and citron-peel. He muſt alſo carefully abſtain from aliments of hard digeſtion, and ſuch as generate bad juices. On the contrary, broth prepared of tortoiſes, cray-fiſh, veal, fowls, lettuce, and garden ſuccory, are of ſingular ſervice. 6. In order to augment the concoctive force of the ſtomach, which in a phthiſis is very languid, it is expedient between meals to exhibit ſome balſamic pectoral, and ſtomachic elixir, ſuch as that made of the beſt myrrh, ſaffron, nutmegs, orange-peel, marſh-trefoil, and liquorice-root.

As to the pectoral and vulnerary balſams, the forms recommended by the moſt celebrated phyſicians are, according to the ſame author, the following ones.

Take of the oil of St. John's wort, two ounces; of ſperma-ceti, ſix drachms; of the beſt venice-turpentine, three drachms; of dragon's-blood, one drachm; and of laudanum-opiatum, ſix grains: mix all together, and let the doſe be from one to two drachms.

Nor, ſays he, have I found the following balſam leſs efficacious: take of the oil of ſweet-almonds, two ounces; and of the flowers of ſulphur, ſublimed by quick-lime, two drachms: boil over a gentle fire; then add, of the balſam-capivi, one drachm; of ſperma-ceti and bees-wax, each half an ounce; of the extract of ſaffron, half a drachm; and of the oils of aniſe, fennel, and mace, each ten drops.

Another balſam for anſwering the ſame end may be prepared thus: take, of the beſt pruſſian honey and mountain-diacodium, each one ounce; of the aqueous eſſence of myrrh inſpiſſated, half an ounce; of the flowers of ſulphur, and the extract of the tops of yarrow, each two drachms; of the extract of ſaffron, half a drachm; and, of the oils of mace and ſaſſafras-wood, each eight drops.

Theſe noble and efficacious balſams, when their uſe is indicated, cannot be exhibited in a better or more proper vehicle, than a ſufficient quantity of the milk of aſſes, goats, or cows.

In colliquative ſweats, Morton recommends the free uſe of pearl-julep; to which may be added chalk, coral, dragon's blood, or other abſorbents: the patient ſhould not be allowed to ſleep too long, and the bed-clothes ſhould be lighter.

As for ſymptomatic conſumptions, ariſing from a gonorrhœa, the fluor-albus, a diarrhœa, &c. the method of cure will be found under the articles GONORRHOEA, FLUOR-ALBUS, &c.

PHYGETHLON, in ſurgery, a broad, but not much elevated tumour, of the ſame nature with the bubo. See the article BUBO.

PHYLACTERY, in antiquity, a charm, or amulet, which being worn, was ſuppoſed to preſerve people from certain evils, diſeaſes, and dangers. See the article AMULET.

The Jews were remarkable for wearing phylacteries of parchment, in the form of ſlips or rolls, wherein were written certain paſſages of the law: theſe they wore upon their foreheads, and upon the wriſts of their left arms. The modern Jews think themſelves under no obligation to this practice, which they obſerve only at morning prayers.

PHYLLANTHUS, in botany, a genus of the monoecia-triandria claſs of plants, without any flower petals: the calyx is monophyllous, campanulated, and divided into ſix parts: the fruit is a roundiſh capſule, with three cells, in each of which is a ſingle ſeed.

PHYLLIS, in botany, a genus of the pentandria-digynia claſs of plants, the corolla of which conſiſts of five lanceolated and obtuſe petals, juſt cohering at their baſes: the fruit is of a turbinato-oblong, obtuſe, and angular figure, compoſed of two parallel ſeeds.

PHYLLONA, in botany, a genus of moſſes, conſiſting only of a thin membranaceous matter, reſembling in ſome degree a leaf; whence the name. See the article MOSS.

PHYMA, in ſurgery, any kind of tumour. See the article TUMOUR.

PHYSALIS, or ALKEKENGI, in botany. See the article ALKEKENGI.

PHYSETER, in ichthyology, the name of a genus of fiſhes of the order of the plagiuri, having teeth only in the lower jaw that are crooked; on the back there is a fin, of a large and tall ſpine; and the opening or fiſtula for the diſcharge of the water is in the front part of the head. See the article PLAGIURI.

This genus comprehends the crooked-toothed whale, and the plane-toothed whale. See the article WHALE.

PHYSETER is alſo a ſpecies of balæna, or whale, with the fiſtula in the middle of the head, and a pinniform tuberoſity on the

the back: it is equal in length to the greenland-whale, but not a third of its thickneſs.

PHYSIC, φυσικη, the ſame with medicine. See the article MEDICINE.

PHYSICAL, ſomething relating to nature. See the articles NATURE and NATURAL PHILOSOPHY.

PHYSICIAN, a perſon who profeſſes medicine, or the art of healing diſeaſes. See MEDICINE and DISEASE.

For an account of the college of phyſicians in London, ſee the article COLLEGE.

PHYSICS, a denomination ſometimes given to natural philoſophy. See the article NATURAL PHILOSOPHY.

PHYSIOGNOMONICS, among phyſicians, denote ſuch ſigns as being taken from the countenance, ſerve to indicate the ſtate, diſpoſition, &c. both of the body and mind: and hence the art of reducing theſe ſigns to practice is termed phyſiognomy, than which nothing can be more precarious, in ſo far as it reſpects the characters of people accuſtomed by education and practice to diſſemble their ſentiments.

PHYSIOLOGY, properly denotes a diſcourſe of nature, and natural bodies; or, it is that part of natural philoſophy which treats of the various phænomena of nature in a ſcientifical and ſpeculative way; in which ſenſe, neither chemiſtry nor experimental philoſophy are included under it. However, as experiments ought always to precede any reaſonings concerning the natures and properties of natural bodies, we have given the rules to be obſerved in drawing concluſions from them under the article EXPERIMENTAL PHILOSOPHY.

If we take a view of the ſeveral phænomena, and compare them together, we may obſerve ſome likeneſs and conformity between them. For example, in the falling of a ſtone to the ground, in the riſing of the ſea towards the moon, in coheſion and cryſtallization, there is ſomething alike; namely, an union or mutual approach of bodies: ſo that any one of theſe, or the like phænomena, may not ſeem ſtrange or ſurpriſing to a man who has nicely obſerved and compared the effects of nature: for that only is thought ſo which is uncommon, or a thing by itſelf, and out of the ordinary courſe of our obſervation. That bodies ſhould tend towards the center of the earth is not thought ſtrange, becauſe it is what we perceive every moment of our lives; but that they ſhould have a like gravitation towards the center of the moon, may ſeem odd and unaccountable to moſt men, becauſe it is diſcerned only in the tides; but a philoſopher, whoſe thoughts take in a larger compaſs of nature, having obſerved a certain ſimilitude of appearances, as well in the heavens as the earth, that argue innumerable bodies to have a mutual tendency towards each other, which he denotes by the general name attraction, whatever can be reduced to that he thinks juſtly accounted for; and thus he explains the tides by attraction. See the articles ATTRACTION and TIDES.

If therefore we conſider the difference there is betwixt natural philoſophers and other men, with regard to their knowledge of the phænomena, we ſhall find it conſiſts only in a greater largeneſs of comprehenſion; whereby analogies, harmonies, and agreements are diſcovered in the works of nature, and the particular effects explained; that is, reduced to general rules, which rules, grounded on the analogy and uniformneſs obſerved in the production of natural effects, are moſt agreeable and ſought after by the mind; for that, they extend our proſpect beyond what is preſent and near to us, and enable us to make very probable conjectures touching things that may have happened at very great diſtances of time and place, as well as to predict things to come; which ſort of endeavour towards omniſcience, is much affected by the mind.

Among phyſicians, the term phyſiology denotes the hiſtory of the human body and its ſeveral conſtituent parts, with their relations and functions.

PHYTEUMA, CRETIC RAMPIONS, in botany, a genus of the pentandria-monogynia claſs of plants, the flower of which is compoſed of a ſingle ſtellated petal: the fruit is a roundiſh capſule, and contains three cells, with numerous ſeeds.

PHYTOLACCA, in botany, a genus of the decandria-decagynia claſs of plants, the corolla whereof conſiſts of five roundiſh, hollow, patent petals: the fruit is an orbiculated depreſſed berry, with ten longitudinal furrows, and as many cells, in each of which is a ſingle kidney-ſhaped ſeed.

PHYTOLOGY, a diſcourſe concerning the kinds and virtues of plants.

PIA MATER, in anatomy, the third tunic or membrane of the brain, placed immediately

mediately under the tunica arachnoides, and closely and firmly connected to the brain: it not only extends over the whole surface of the brain, but insinuates itself into all its cavities, and is carried down to the bottom of all its furrows. It covers also the spinal marrow, and all the nerves, and adheres also to the tunica arachnoides very closely and firmly, in the upper part of the head; but much less so below, with the dura mater.

Its blood vessels are common to the rest of the brain, and are very numerous; so that it seems in a manner wholly composed of them. The arteries are from the internal carotids and vertebrals: some of the veins discharge themselves into the sinuses of the dura mater, and others immediately into the jugular and vertebral veins. The use of the pia mater is to support the blood vessels of the brain, which it also serves as a covering to, that they may be the more conveniently distributed through all its furrows and anfractuosities; for secreting proper fluids in the brain, and forming the animal spirits.

PIACE, SE PIACE, or AD LIBITUM, in the italian music, signifies, that the part it is joined to may be repeated or not, at pleasure.

PIACENZA, or PLACENTIA. See the article PLACENTIA.

PIACHE, or PIAZZA. See PIAZZA.

PIANOSA, an island of Italy, in the Tuscan sea, situated a little south-west of the isle of Elba, and subject to Tuscany, east long. 11°, north lat. 42° 36′.

PIASTER, a spanish coin, more ordinarily called a piece of eight. See the article *Spanish* COINS.

PIAVA, a river of Italy, which rises in Tyrol, and falls by two mouths into the gulph of Venice.

PIAZZA, in building, a portico, or covered walk, supported by arches. See the article PORTICO.

PICA, in zoology, the largest animal of the mus, or mouse kind, being as big as a pig of a week old: it is of a brown colour spotted with grey, and with a white belly; the upper lip is divided, and a little longer than the under one; the ears are short, and obtuse; the body is thick and fleshy, and the legs short, especially the fore ones. See plate CXCIX. fig. 1.

It is a native of the East-Indies, and South-America; its voice is like that of a hog, and it strikes with the head in the manner of that animal, and raises the bristles on the back when angry: hence, Ray calls it mus brasilienſis magnus, porcelli pilis et voce.

PICA, in medicine, a depravation of appetite, which makes the patient long for what is unfit for food, or incapable of nourishing, as chalk, ashes, coals, plaster, lime, &c. See MALACIA.

PICÆ, in ornithology, a class of birds, which have the beak convex and compressed.

This class comprehends several genera; as, the ramphastos, buceros, corvus, picus, &c. See RAMPHASTOS, &c.

PICARDS, a sect so called from their leader, one Picard, a Fleming, who, about the beginning of the fifteenth century, improved upon the error of the Adamites, in respect to nakedness; and who pretended that he was sent into the world, as another Adam, to restore the law of nature, which, he said, consisted principally of two things, a community of women, and a nakedness of all the parts of the body.

PICARDY, a province of France, bounded by the french Netherlands and the Streights of Dover, on the north and east; by the isle of France, on the south; and by Normandy and the English channel, on the west.

PICIGHITONE, a town of Italy, in the dutchy of Milan, thirty-three miles south-east of the city of Milan.

PICKAGE, or PICCAGE, an antient custom or duty paid at fairs and markets, for breaking the ground, and pitching up stalls or standings.

PICKEERING, or PICQUEERING. See the article PICQUEERING.

PICKERING, a market-town of Yorkshire, twenty-two miles north-east of York.

PICKET, PICQUET, or PIQUET, in fortification, a painted staff shod with iron; used in marking out the angles and principal parts of a fortification, when the engineer is tracing out a plan upon the ground.

There are also larger pickets, or painted stakes, which are driven into the earth to hold together fascines or faggots, in any work cast up in haste.

Pickets are likewise the stakes driven into the ground near the tents of the horsemen in a camp, to tie their horses to; and before the tents of the foot, where they rest their musquets or picks about them in a ring. The same name is also given

to

to the ſtakes with notches towards the top, to which are faſtened the cordages of tents: thus to plant the picket is to encamp. When a horſeman has committed any conſiderable offence, he is ſometimes ſentenced to ſtand upon the picket, which is to have one hand and the oppoſite foot tied together, and being drawn up from the ground by the other hand, he is obliged to ſtand with one foot on the point of a picket or ſtake, ſo that he can neither ſtand nor hang without great pain, nor eaſe himſelf by changing feet.

PICKET-GUARD. See PICQUET-GUARD.

PICKLE, a brine or liquor, commonly compoſed of ſalt, vinegar, *&c.* ſometimes with the addition of ſpices, wherein meat, fruit, and other things are preſerved and ſeaſoned. The ſame name is alſo given to any vegetable production prepared in pickle.

The methods of pickling the various ſorts of vegetables, and even thoſe of the ſame kind, are very different: we ſhall therefore content ourſelves with giving one out of the numerous methods of pickling walnuts: Take walnuts before the ſhell is grown hard, ſcald them, and rub off the outer ſkin; then put them into water and ſalt for nine or ten days, ſhifting them every other day, and keeping them cloſe covered from the air; then dry them, and prepare the pickle as follows: For half an hundred of large walnuts, take two quarts of white-wine vinegar; long pepper, black pepper, and ginger, of each half an ounce; cloves, mace, and nutmegs, of each a quarter of an ounce: pound the ſpice, and with it a ſpoonful of muſtard-ſeed; ſtrew this between every layer of walnuts, pour the liquor boiling hot upon them, and keep them cloſe ſtopped.

Broom-buds, capers, and olives are pickled with oil and vinegar.

Pickles on being imported pay a duty of $7\frac{187}{100}$d. the gallon, and, on exportation, draw back, $6\frac{467}{100}$d.

PICO, one of the azores iſlands, ſituated in the atlantic ocean: weſt long. 20°, north lat. 39°, ſubject to Portugal.

PICQUEERING, PICKEERING, or PICKEROONING, a flying war or ſkirmiſh made by ſoldiers detached from two armies for pillage, or before a main battle begins.

PICQUET, a celebrated game at cards played between two perſons, with only thirty-two cards; all the duces, threes, fours, fives, and ſixes being ſet aſide.

In playing at this game twelve cards are dealt to each, and the reſt laid on the table: when if one of the gameſters find he has not a court-card in his hand, he is to declare that he has carte blanche, and tell how many cards he will lay out, and deſire the other to diſcard, that he may ſhew his game, and ſatisfy his antagoniſt, that the carte blanche is real; for which he reckons ten. And here the eldeſt hand may take in three, four or five, diſcarding as many of his own for them, after which the other may take in all the remainder if he pleaſes. After diſcarding, the eldeſt hand examines what ſuit he has moſt cards of; and, reckoning how many points he has in that ſuit, if the other has not ſo many in that, or any other ſuit, he reckons one for every ten in that ſuit, and he who thus reckons moſt is ſaid to win the point. It is to be obſerved, that in thus reckoning the cards, every card goes for the number it bears; as a ten for ten; only all court-cards go for ten, and the ace for eleven, and the uſual game is one hundred up. The point being over, each examines what ſequences he has of the ſame ſuit, *viz.* how many tierces, or ſequences of three cards; quartes, or ſequences of four cards; quintes, or ſequences of five cards, *&c.* he has. Theſe ſeveral ſequences are diſtinguiſhed in dignity by the cards they begin from: thus, ace, king, and queen, are ſtiled tierce major; king, queen, and knave, tierce to a king; knave, ten, and nine, tierce to a knave; and the beſt tierce, quarte, or quinte prevails, ſo as to make all the others in that hand good, and to deſtroy all thoſe in the other hand. In like manner a quarte in one hand ſets aſide a tierce in the other.

The ſequences over, they proceed to examine how many aces, kings, queens, knaves and tens each holds; reckoning for every three of any ſort, three; but here too, as in ſequences, he that with the ſame number of threes or fours, has one that is higher than any the other has, makes his own good, and ſets aſide all his adverſary's; but four of any ſort, which is called a quatorze, becauſe fourteen are reckoned for it, always ſet aſide three.

The game in hand being thus reckoned, the

the eldeſt proceeds to play, reckoning one for every card he plays above nine, while the other follows him in the ſuit: but unleſs a card be won by one above nine, except it be the laſt trick, nothing is reckoned for it. The cards being played out, he that has moſt tricks reckons ten for winning the cards: but if they have tricks alike, neither reckons any thing. If one of them wins all the tricks, inſtead of ten, which is his right for winning the cards, he reckons forty, and this is called capot.

The deal being finiſhed, each perſon ſets up his game: they then proceed to deal again as before; cutting afreſh each time for the deal: if both parties are within a few points of being up, the carte blanche is the firſt that reckons, then the point, then the ſequences, then the quatorzes, then the tierces, and then the tenth cards. He that can reckon thirty in hand by carte blanche, points, quintes, &c. without playing, before the other has reckoned any thing, reckons ninety for them, and this is called a repike; and if he reckons above thirty, he reckons ſo many above ninety. If he can make up thirty, part in hand, and part in play, before the other has told any thing, he reckons for them ſixty; and this is called a pique, whence the name of the game. Mr. de Moivre, in his doctrine of chances, has reſolved, among others, the following problems: 1. To find, at picquet, the probability which the dealer has for taking one ace or more in three cards, he having none in his hands. He concludes from his computation, that it is 29 to 28 that the dealer takes one ace or more. 2. To find at picquet the probability which the eldeſt has of taking an ace or more in five cards, he having no ace in his hands. Anſwer; 232 to 91, or 5 to 2, nearly. 3. To find at picquet the probability which the eldeſt has of taking both an ace and a king in five cards, he having none in his hand. Anſwer; the odds againſt the eldeſt hand taking an ace and a king are 331 to 315, or 21 to 20 nearly. 4. To find at picquet the probability of having twelve cards dealt to, without king, queen, or knave; which caſe is commonly called cartes blanches. Anſwer; the odds againſt cartes blanches are 323 to 578956, or 1791, to 1 nearly. 5. To find how many different ſets eſſentially different from one another, one may have at picquet before taking in. Anſwer; 28,967,278. This number falls ſhort of the ſum of all the diſtinct combinations, whereby twelve cards may be taken out of 32, this number being 225,792,840; but it ought to be conſidered, that in that number ſeveral ſets of the ſame import, but differing in ſuit, might be taken, which would not introduce an eſſential difference among the ſets.

PICRA, or HIERA PICRA. See the article HIERA PICRA.

PICRIS, *langue de beuf*, in botany, a genus of the ſyngeneſia-polygamia-æqualis claſs of plants, the compound flower of which is imbricated and uniform, with equal and numerous hermaphrodite corollulæ; the partial flower is monopetalous, ligulated, lineated, truncated, and quinquedentated; there is no pericarpium; the ſeed, which is contained in the cup, is ſingle, ventricoſe, obtuſe, and crowned with a plumoſe pap.

PICTS-WALL, in antiquity, a wall begun by the emperor Adrian, on the northern bounds of England; to prevent the incurſions of the Picts and Scots. It was firſt made only of turf, ſtrengthened with paliſadoes, till the emperor Severus coming in perſon into Britain built it with ſolid ſtone. This wall, part of which ſtill remains, begun at the entrance of Solway-frith in Cumberland, and running N. E. extended to the German ocean.

PICTURE, a piece of painting, or a ſubject repreſented in colours, on wood, canvas, paper, or the like.

Pictures four feet ſquare, or containing 16 ſuperficial feet, or upward, on being imported pay 3 l. thoſe of two feet ſquare, or four ſuperficial feet, and under 16 feet, pay 2 l. and thoſe under two feet ſquare, or four ſuperficial feet, pay 1 l.

PICUS, the WOOD-PECKER, in ornithology. See the article WOOD-PECKER.

PIECE, in commerce, ſignifies ſometimes a whole, and ſometimes a part of the whole. In the firſt ſenſe, we ſay a piece of cloth or velvet, &c. meaning a certain quantity of yards regulated by cuſtom; being yet entire, and not cut. In the other ſignification we ſay a piece of tapeſtry; meaning a diſtinct member wrought apart, which, with ſeveral others, make one hanging.

PIECE, in matters of money, ſignifies ſometimes the ſame thing with ſpecies; and ſometimes by adding the value of the pieces, it is uſed to expreſs ſuch as have no other particular name. For the piece of eight or piaſtre, ſee COIN.

PIECE is also a kind of money of account, or rather a manner of accounting used among the negroes on the coast of Angola in Africa. See the article MONEY.

PIECE, in heraldry, denotes an ordinary or charge. See the articles ORDINARY and CHARGE.

The honourable pieces of the shield are the chief, fesse, bend, pale, bar, cross, saltier, chevron, and in general all those which may take up one third of the field, when alone, and in what manner soever it be. See CHIEF, FESSE, &c.

PIECES, in the military art, include all sorts of great guns and mortars. Battering pieces are the larger sort of guns used at sieges for making the breaches, such are the twenty-four pounder, and culverine, the one carrying twenty-four, and the other an eighteen, pound-ball. Field pieces are twelve-pounders, demiculverines, six-pounders, sakers, minions, and three-pounders, which march with the army, and encamp always behind the second line, but in day of battle are in the front. A soldier's firelock is likewise called his piece.

PIED DE PORT, *St.* JOHN, a town of France, in the province of Gascony, at the foot of the Pyrenees, situated sixteen miles south of Bayonne.

PIEDMONT, a principality of Italy, so called from its lying at the foot of the Alps. It is bounded by Savoy, from which it is separated by the Alps on the north, by the dutchies of Milan and Montferrat on the east, by the territories of Genoa and the county of Nice on the south, and by France on the west; being about 100 miles long and 70 broad.

PIEDOUCHE, in architecture, a little stand or pedestal, either oblong or square, enriched with mouldings, serving to support a bust, or other little figure.

PIEDROIT, in architecture, a pier or square kind of pillar, part whereof is hid within a wall. The only thing wherein it differs from a pilaster is, that the latter has a regular base and capital, which the other wants. See PILASTER. This term is also used for part of the solid wall annexed to a door or window, comprehending the door-post, chambranle, tableau, leaf, &c.

PIENZA, a town of Italy, in the dutchy of Tuscany and territory of Sienna, twenty eight miles south-east of Sienna.

PIEPOWDER COURT, or PEDES PULVERISATI, a court held in fairs for doing justice to buyers and sellers, and redressing disorders there committed. It is so called, as being most usually held in the summer, when the suitors to the court have dusty feet, &c. This is a court of record, incident to every fair, and is to be held only during the time the fair is kept. For its jurisdiction, the cause of action on any contract, &c. must arise in the same fair, or market, and not before at a former fair, not after the fair, and be done, complained of, heard, and determined, the same day. The steward is judge, and the trial is by merchants and traders in the fair, and judgment against the defendant shall be that he be amerced, &c.

PIER, or PEER, in building, denotes a mass of stone, &c. opposed by way of fortress against the force of the sea, or a great river, for the security of ships that lie at harbour in any haven.

It is also used in architecture for a kind of pilaster, or buttress, raised for support, strength, and sometimes for ornament.

PIERCED, PERCE', in heraldry, is when any ordinary is perforated, or struck through, shewing, as it were, a hole in it, which must be expressed in blazon, as to its shape: thus if a cross have a square hole, or perforation in the centre, it is blazoned square-pierced, which is more proper than quarterly-pierced, as Leigh expresses it. When the hole or perforation is round, it must be expressed round-pierced; if it be in the shape of a lozenge, it is expressed pierced lozenge-ways. All piercings must be of the colour of the field, and when such figures appear on the centre of a cross, &c. of another colour, the cross is not to be supposed pierced, but that the figure on it is a charge, and must be accordingly blazoned.

PIERCING, among farriers. To pierce a horse-shoe lean, it is to pierce it too near the edge of the iron: to pierce it fat, is to pierce it farther in.

St. PIERRE DE MONTIER, a town of France, in the province of Orleans, and territory of Nivernois, situated ten miles south of Nevers.

PIETANTIA, or PITTANCE, a portion of victuals distributed to the members of a college, or other community, upon some great festivals.

PIETISTS, a religious sect sprung up among the protestants of Germany, seeming to be a kind of mean between the quakers of England, and the quietists

of the Romiſh church. See the article QUAKERS, &c.

They deſpiſe all ſorts of eccleſiaſtical polity, all ſchool theology, and all forms and ceremonies, and give themſelves up to contemplation and the myſtic theology.

PIEVE DE CUDORE, or CONDORE, a town of Italy, in the territory of Venice, capital of the province of Cadorin, in eaſt long. 12° 30′, north lat. 46° 40′.

PIG, in zoology, the young of the hog kind. See the article HOG.

Guinea-PIG. See the article GUINEA-PIG.

PIG *of lead*, the eighth part of a fother, amounting to two hundred and fifty pounds weight.

PIGEON, in ornithology. See the article COLUMBA.

PIGEON-HOUSE, a houſe erected full of holes within for the keeping, breeding, &c. of pigeons, otherwiſe called a dove-cote.

Any lord of a manor may build a pigeon-houſe on his land, but a tenant cannot do it without the lord's licence. When perſons ſhoot at or kill pigeons within a certain diſtance of the pigeon-houſe, they are liable to pay a forfeiture.

PIGMENTS, *pigmenta*, preparations uſed by painters, dyers, &c. to impart colours to bodies, or to imitate particular colours.

When glaſs is ſtained and coloured, as in painting on glaſs, or for counterfeiting gems, or precious ſtones, the pigment is always of a metalline or mineral nature. See the article COLOUR, &c.

PIGNEROL, a town of Italy, in the province of Piedmont, ſituated on the river Chizon, ten miles ſouth-weſt of Turin.

PIGUS, in ichthyology, a ſpecies of the cyprinus. See the article CYPRINUS.

This fiſh is of the ſame ſhape and ſize with the common carp, and its eyes, fins, and fleſhy palate wholly the ſame. From the gills to the tail there runs a dotted crooked line.

PIGMY, or PYGMY. See PYGMY.

PIKE, an offenſive weapon, conſiſting of a ſhaft of wood, twelve or fourteen feet long, headed with a flat-pointed ſteel, called the ſpear. The pike was a long time in uſe among the infantry, to enable them to ſuſtain the attack of the cavalry, but it is now taken from them, and the bayonet, which fixes on at the end of the carabine is ſubſtituted in its place. Yet the pike ſtill continues the weapon of foot-officers, who fight pike in hand, ſalute with the pike, &c.

PIKE, in ichthyology, the ſame with lucius. See the article LUCIUS.

PIKE-FISHING. See the article FISHING.

PILA, in building, the ſame with pier. See the article PIER.

PILA, among antiquarians, denotes the arms-ſide of a piece of money, which was probably ſo called becauſe it antiently bore the impreſſion of a church built on piles.

PILASTER, in architecture, a ſquare column, ſometimes inſulated, but more frequently let within a wall, and only ſhewing a fourth or fifth part of its thickneſs. The pilaſter is different in different orders; it borrows the name of each, and has the ſame proportions, and the ſame capitals, members and ornaments with the columns themſelves. Pilaſters are however uſually made without either ſwelling or diminution, and as broad at top as at the bottom; though ſome of the modern architects, as M. Manſard, &c. diminiſh them at the top, and even make them ſwell in the middle, like columns, particularly when placed behind columns.

Mr. Perrault obſerves, that pilaſters, like columns, become of different kinds, according to the different manner in which they are applied to the wall. Some are wholly detached, and theſe Vitruvius calls paraſtatæ; others have three faces clear out of the wall; others two; and others only one; theſe Vitruvius calls antæ. Inſulate pilaſters are but rarely found in the antique; for the chief uſe the antients made of them, was to give the greater ſtrength to the extremities of porticoes.

There are four things to be principally regarded in pilaſters, their projecture out of the wall; their diminution; the diſpoſition of the entablature, when it happens to be common to them and to a column, and their flutings and capitals. 1. Then, the projecture of pilaſters that have only one face out of the wall, ought to be one eighth of their breadth, or at moſt one ſixth; but when they receive impoſts againſt their ſides, the projecture may be a quarter of their diameter. 2. Pilaſters are ſeldom diminiſhed when they have only one face out of the wall: indeed when they ſtand in the ſame line with columns, and the entablature is continued over both, without any break, the pilaſters are to have the ſame dimenſions

with the columns. 3. Pilaſters are ſometimes fluted, though the columns that accompany them are not ſo; and on the contrary, the columns are ſometimes fluted, when the pilaſters that accompany them are not. The flutings of pilaſters are always odd in number, except in half pilaſters, which meet at inward angles, where four flutings are made for three, &c. 4. The proportions of the capitals of pilaſters, are the ſame as to height with thoſe of columns; but they differ in breadth, the leaves of pilaſters being much broader; becauſe pilaſters, though of equal extent, have only the ſame number of leaves for their girt, *viz.* eight. Their uſual diſpoſition is to have two in each face in the lower row, one in the middle, and two halves in the angles, in the turns of which they meet. Add to this, that the rim of the vaſe, or tambour, is not ſtrait, as the lower part is; but a little circular and prominent in the middle. See the article FLUTINGS.

In pilaſters that ſupport arches, the proportions, according to Palladio, ſhould be regulated by the light they are placed in; and at the angles by the weight they are to ſuſtain: they muſt not be too tall and ſlender, leſt they reſemble pillars, nor too dwarfiſh and groſs, leſt they appear like the piers of bridges. In private buildings they ought not to be narrower than one third, nor broader than two thirds of the vacuity, or interſpace between pilaſter and pilaſter; but as for thoſe that ſtand at the corners, they may have a little more latitude allowed them, to give the greater ſtrength to the angles. Palladio obſerves, that in the theatres and amphitheatres, and ſuch maſſive works, they have been as broad as the half, and ſometimes as the whole vacuity or interſpace. He alſo aſſerts, that their true proportion ſhould be an exact ſquare; but for leſſening of expence, they are uſually made narrower in flank than in front.

PILAW, a port-town of Poland, in the territory of ducal Pruſſia, ſituated on the Baltic, eaſt long. 20°, north lat. 54° 45′, ſubject to the king of Pruſſia.

PILCHARD, *pilchardus*, in ichthyology, a ſpecies of clupea, with the upper jaw biſid, and ſpotted on each ſide with black. See the article CLUPEA.

PILE, in antiquity, a pyramid built of wood, on which the bodies of the deceaſed were laid in order to be burnt.

PILE, in building, is uſed for a large ſtake rammed into the ground in the bottom of rivers, or in marſhy land, for a foundation to build upon.

Pile is alſo uſed among architects for a a maſs of building.

PILE, in coinage, denotes a kind of puncheon, which in the old way of coining with the hammer, contained the arms, or other figure and inſcription to be ſtruck on the coin. See COINAGE.

Accordingly we ſtill call the arms ſide of a piece of money the pile, and the head, the croſs; becauſe in antient coin, a croſs uſually took the place of the head in ours: but ſome will have it called pile, from the impreſſion of a church built on piles, ſtruck on this ſide our antient coins, and others will have it to come from *pile*, the old french word for a *ſhip*.

PILE, in heraldry, an ordinary in form of a wedge, contracting from the chief, and terminating in a point towards the bottom of the ſhield. See pl. CXCVII. fig. 6. The pile, like other ordinaries, is borne inverted, ingrailed, &c. and iſſues indifferently from any point of the verge of an eſcutcheon.

PILES, in medicine, the ſame with hæmorrhoids. See HÆMORRHOIDS.

PILGRIMAGE, a kind of religious diſcipline, which conſiſts in taking a journey to ſome holy place, in order to adore the relics of ſome deceaſed ſaint. Pilgrimages began to be made about the middle ages of the church; but they were moſt in vogue after the end of the eleventh century, when every one was for viſiting places of devotion, not excepting kings and princes themſelves; and even biſhops made no difficulty of being abſent from their churches on the ſame account. The places moſt viſited were Jeruſalem, Rome, Compoſtella; and Tours; but the greateſt numbers now reſort to Loretto, in order to viſit the chamber of the bleſſed virgin, in which ſhe was born, and brought up her ſon Jeſus, till he was twelve years of age. This chamber, it is pretended, was carried by angels into Dalmatia, about the year 1291, and afterwards in the ſame manner tranſported to Loretto, where a magnificent cathedral is built over it. In this chamber, is the image of the bleſſed Virgin, almoſt covered with pearls and diamonds, and round the ſtatue is, a kind of rainbow formed of precious ſtones of various colours. Five hundred thouſand pilgrims ſometimes

times reſort to this houſe in one year, in order to pay their devotions before this glorious image.

The mahometans are commanded in the Koran, to perform a pilgrimage to Mecca; this is one of the capital points of their religion, and therefore a prodigious cavalcade of pilgrims annually go thither, in the company of thoſe who are ſent with the grand ſeignor's preſents, to the tomb of Mahomet.

PILL, in pharmacy, a form of medicine reſembling a little ball, to be ſwallowed whole, invented in favour of ſuch as cannot take bitter and ill taſted medicinal draughts, as alſo to keep in readineſs for occaſional uſe without decaying.

Pills are a form, into which little is reduced, beſides cathartics in officinal compoſition. The quantity of thoſe generally aſſigned for a doſe, will not admit of alteratives, which generally take up more room; for the force of a cathartic commonly lying in a ſmall compaſs, half a dram, which makes four, five, or ſix pills, is generally ſufficient for a doſe, while a doſe of moſt alteratives would amount to fifteen or twenty. But nothing ought to be made up in this form that is ſoluble by the air, as many ſalts are, becauſe they will run, and deſtroy the form; and for the ſame reaſon, nothing ought to be thus mixed, that will ferment; upon which account, all volatile ſalts are to be excluded, becauſe they would make the pills ſwell to ſix times the bulk.

Some of the moſt uſeful pills of the ſhops, are, 1. Aromatic pills, thus made: take of ſuccotrine aloes, an ounce and a half, of gum guaiacum, an ounce; the aromatic ſpecies and balſam of peru, of each half an ounce: let the aloes and gum guaiacum be powdered ſeparately, then mixed with the reſt, and formed into a maſs with the ſyrup of orange peel. 2. The more ſimple pills of coloquintida, are thus prepared: Take the pith of coloquintida, and ſcammony, of each two ounces; of oil of cloves, two drams: let the dry ſpecies be reduced to powder ſeparately, let the oil be mixed with them, and the whole be formed into a maſs with ſyrup of buckthorn. 3. Ecphractic, or deobſtruent pills are thus prepared: take of the aromatic pill, three ounces; rhubarb, extract of gentian, and ſalt of iron, of each one ounce; of ſalt of wormwood, half an ounce: beat them with a proper quantity of ſolutive ſyrup of roſes, into a maſs. 4. Gum-pills, thus prepared: take galbanum, opopanax, myrrh, ſagapenum, of each an ounce; of aſafœtida, half an ounce: make them into a maſs with the ſyrup of ſaffron. 5. Mercurial pills, prepared thus: take of quick-ſilver, five drams; of ſtraſburg turpentine, two drams; of the cathartic extract, four ſcruples; of rhubarb, in powder, one dram: firſt grind the quick-ſilver with the turpentine, till it appear no longer, then beat them up with the reſt, into a maſs: if the turpentine chance to be too thick, it is to be thinned with a little oil of olives. 6. Soap-pills, thus prepared: take of almond-ſoap, four ounces; of ſtrained opium, half an ounce; of eſſence of lemons, a dram. Beat the opium, ſoftened with a little wine, along with the reſt, till they are perfectly mixed. 7. Storax pills, prepared thus: take of ſtrained ſtorax, two ounces; of ſaffron, an ounce; of ſtrained opium, five drams; beat them together, till they are perfectly mixed, and make them into pills.

PILLAGE, among builders, is a ſquare pillar, ſtanding behind a column, to bear up arches.

PILLAR, in architecture, a kind of irregular column, round and inſulated, but deviating from the proportions of a juſt column.

Pillars are always either too maſſive, or too ſlender for regular architecture; ſuch are the pillars which ſupport gothic vaults, or buildings; and indeed, they are not reſtrained by any rules, their parts and proportions being arbitrary.

Butting PILLAR, the ſame with a buttreſs, See the article BUTTRESS.

Square PILLAR, a maſſive work, called alſo a pier or piedroit, ſerving to ſupport arches, *&c.*

PILLAR, in the manege, is the center of the ring, or manege-ground, round which a horſe turns, whether there be a pillar in it or not. Beſides this, there are pillars on the circumference, or ſides of the manege-ground, placed at certain diſtances, by two and two, from whence they are called the two pillars, to diſtinguiſh them from that of the center. The uſe of the pillar in the center, is for regulating the extent of ground, that the manege upon the volts may be performed with method and juſtneſs, and that they may work in a ſquare, by rule and meaſure, upon the four lines of the volts; and alſo to break unruly high-mettled horſes

horſes, without endangering the rider. The two pillars are placed at the diſtance of two or three paces, one from the other, and the horſe is put between thoſe, to teach him to riſe before, and yerk out behind, and put himſelf upon raiſed airs, &c. either by the aids, or chaſtiſements.

PILLORY; was antiently a poſt erected in a croſs road, by the lord of the manor, with his arms upon it, as a mark of his ſeignory, and ſometimes with a collar to fix criminals to. At preſent, it is a wooden machine, made to confine the head and hands, in order to expoſe criminals to public view, and to render them publicly infamous. According to Sir Henry Spelman, it was firſt peculiarly intended for the puniſhment of bakers, who ſhould be found faulty in the weight or fineneſs of their bread. At preſent the perſons thus puniſhed, are foreſtallers, thoſe uſing falſe weights, perſons guilty of perjury, &c.

PILOT, a perſon employed to conduct ſhips over bars and ſands, or through intricate channels, into a road or harbour.

Pilots are no conſtant and ſtanding officers aboard our veſſels, but are called in occaſionally, on coaſts or ſhores unknown to the maſter, and having piloted in the veſſel, they return to the ſhore where they reſide.

Pilots taking upon them to conduct ſhips up the Thames, are to be examined and approved by the maſter and wardens of the trinity-houſe at Deptford, or ſhall be liable to forfeit 10 l. for the firſt offence, and 20 l. for the ſecond, &c. and the like penalty, if they act without licence from the ſaid maſter and wardens; and if by their negligence they loſe a ſhip, they ſhall be forever diſabled. 3 Geo. I. and 5 Geo. II. c. 20.

PILSEN, or BILSEN. See BILSEN.

PILSEN is alſo a city of Bohemia, forty miles ſouth-weſt of Prague.

PILULARIA, in botany, a genus of the cryptogamia-muſci claſs of plants; the male flowers of which are diſpoſed like a line of duſt under the leaf; the fruit is a globe containing four cells, in which are lodged a great many ſeeds.

PILY, or *Barry* PILY. See BARRY.

PILZOW, a town of little Poland, forty-two miles north-eaſt of Cracow.

PIMENTA, or PIMENTO, JAMAICA-PEPPER, or ALL-SPICE, in botany, a tree of a moderate ſize, called by Sir Hans Sloane, myrtus arborea aromatica, foliis laurinis, latioribus, et ſubrotundis: its flower conſiſts of five petals, and its fruit is a roundiſh berry, containing a pulpy matter about the ſeeds.

The fruits are gathered when green, and are expoſed to the ſun for many days on cloths, frequently ſhaking and turning them, till thoroughly dry; they take great care they are not wetted by the morning and evening dews, and when thus dried, are ſent over to us.

Pimenta abounds with a fragrant eſſential oil, which is ſeparated, in great quantity, in diſtillation, and is ſo heavy that it ſinks in water. This ſpice is much uſed in our foods, and ſometimes in medicine: it is, indeed, a very good aromatic, and ſo well imitates the mixed flavour of all the reſt, that it has long been a common practice to make the aqua mirabilis, which was ordered to be diſtilled from all the ſpices, of this ingredient alone; and the taſte of the water thus made, when carefully done, is ſo near the genuine, that a very nice palate can only diſtinguiſh it.

The preſent college diſpenſatory orders a ſimple water to be diſtilled from it, a gallon from half a pound of that ſpice, which is a better carminative, than any of the former waters retained under that name.

PIMPINELLA, in botany, a plant of the pentandria-digynia claſs, the general corolla of which is uniform; and the partial one conſiſts of five inflexo, cordated and almoſt equal petals; there is no pericarpium; the fruit is of an oval oblong figure, narrower towards the apex, convex and ſtriated on one ſide, and plain on the other.

PIMPLE, in ſurgery, a ſmall puſtule, ariſing chiefly on the face. See the article PUSTULE.

PIN, in commerce, a little neceſſary implement made of braſs-wire, uſed chiefly by the women in adjuſting their dreſs.

The perfection of pins conſiſts in the ſtiffneſs of the wire and its whiteneſs, in the heads being well turned, and in the fineneſs of the points. The London pointing and whitening, are in moſt repute, becauſe our pin-makers, in pointing, uſe two ſteel-mills, the firſt of which forms the point, and the latter takes off all irregulatities, and renders it ſmooth, and as it were poliſhed; and in whitening, they uſe block-tin granulated: whereas in other countries they are ſaid to uſe a mixture of tin, lead, and

BRITISH MUSEUM

Fig. 1. PERSICA, the *PEACH*.

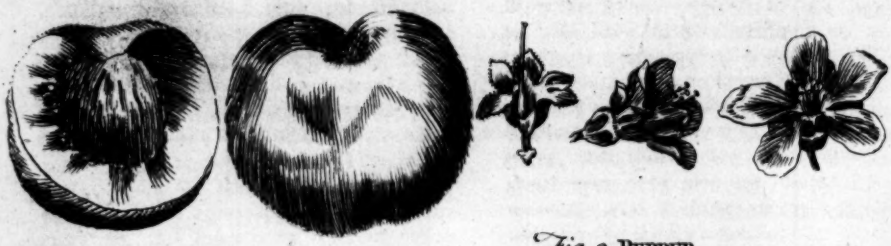


Fig. 3. PEPPER.

Fig. 2. The PINE-TREE.

Fig. 4. PHŒNIS.

Fig. 7. PLATEA, the *SPOON-BILL*.

Fig. 5. POMEE.

Fig. 6. POINTEE.

Fig. 8. PHYTOLACCA.

J. Sheppard sculp.

and quick ſilver; which not only whitens worſe than the former, but is alſo dangerous, on account of the ill quality of that mixture, which renders a puncture with a pin thus whitened, ſomewhat difficult to be cured. The conſumption of pins, is incredible, and there is no commodity ſold cheaper. The number of hands employed in this manufacture is very great, each pin paſſing through the hands of ſix different workmen, between the drawing of the braſs wire, and the ſticking of the pin in the paper.

Pins are ſometimes made of iron wire, rendered black by a varniſh of linſeed-oil, with lamp-black, which the braſs-wire would not receive: theſe are deſigned for the uſe of perſons in mourning, though not univerſally approved of. Pins on being imported, pay for every twelve thouſand, 9 s. 7 ½ d. and, on exportation, draw back 8 s. 5 ¼ d. they alſo pay, if made of braſs, for every twelve thouſand, 2 s. $4\frac{12\frac{1}{2}}{100}$ d. and if made of iron, for every 112 pounds, 4 s. 8 ½ d. is drawn back on exportation.

PINACIA, πινακια, among the Athenians, tablets of braſs, whereon the names of all the perſons in each tribe duly qualified, and willing to be judges or ſenators of the areopagus, being ſeverally written, they were caſt into a veſſel provided on purpoſe; and into another veſſel were caſt the ſame number of beans, an hundred of which were white, and all the reſt black. Then the names of the candidates and the beans were drawn one by one; and thoſe, whoſe names were drawn out together with the white beans, were received into the ſenate. See the article AREOPAGUS.

PINCHING, in gardening, a kind of pruning, performed by nipping off the young and tender ſprigs of trees and plants, between the nails of the thumb and finger, chiefly practiſed in April or May, and ſometimes in June and July, on the large uſeleſs branches, towards the top of a plant or tree, becauſe they conſume a great deal of the ſap. See the article PRUNING.

PINCHING, in the manege, is when, a horſe ſtanding ſtill, the rider holds him faſt by the bridle-hand, and applies the ſpurs juſt to the hairs of his ſides.

Pinching is accounted an aid, ſpurring a chaſtiſement, or correction.

PINDARIC, in poetry, an ode formed in imitation of the manner of Pindar. The pindaric manner is diſtinguiſhed by the boldneſs and height of the flights, the ſuddenneſs and ſurpriſingneſs of the tranſitions; and the ſeeming irregularity, wildneſs, and enthuſiaſm of the whole. The only part remaining of Pindar's works is a book of odes, all in praiſe of the victors at the olympian, pythian, nemæan, and iſthmian games; whence the firſt is intitled the olympians, the ſecond the pythians, the third the nemæans, and the fourth the iſthmians. Pindar is full of force and fire; his thoughts are ſententious; his ſtile impetuous; his ſallies daring and frequently running, as it were, at random, he affects a beautiful diſorder, which yet is ſaid to be the effect of the greateſt art. None of our writers ſeem to have ſucceeded in the pindaric character better than Cowley.

PINE, *pinus*, in botany, a genus of the monœcia monadelphia claſs of plants, having no corolla; the male flowers are diſpoſed in cluſters, the perianthium conſiſts of four caducous leaves; the female flowers are diſpoſed in globes upon the ſame plant: there is no pericarpium; the fruit is a large cone, of a turbinated figure, and compoſed of a very beautiful arrangement of ſquamæ: the ſeed is received into a membranaceous ala. See plate CC. fig. 2. The nucleus pini, or kernels of the cones of the pine, are much uſed in medicine; and they are not only uſed ſo; but, in places where they are to be had freſh and in plenty, are eaten at table, and make an ingredient in ſeveral good diſhes. They are very proper for people inclined to be conſumptive, as they are balſamic and reſtorative: they are alſo good againſt heats of urine, and nephritic complaints; they are either to be eaten or made into an emulſion with almonds and barley-water, or with piſtachias inſtead of almonds. At preſent they are brought to us in abundance from Italy and the ſouth of France.

PINE-APPLE, the ſame with ananas. See the article ANANAS.

PINEA, or PINE, in commerce, a term uſed in Peru and Chili, for a kind of light, porous maſſes, or lumps, formed of a mixture of mercury and ſilver-duſt, from the mines. The ore or mineral of ſilver being dug out of the veins of the

the mine, is firſt broken, then ground in mills for the purpoſe, driven by water with iron peſtles, each of two hundred pound weight: the mineral thus pulverized is next ſifted; then worked up with water into a paſte, which when half dry, is cut into pieces called cuerpos, a foot long, weighing each about two thouſand five hundred pounds. Each cuerpo is again kneeded up with ſea-ſalt, which diſſolving incorporates with it: they then add mercury, from ten to twenty pounds for each cuerpo, kneeding the paſte afreſh, until the mercury be incorporated therewith. This amalgamation is continued for eight or nine days: when it is done enough, they ſend it to the lavatories, which are large baſons that empty ſucceſſively into one another; the paſte, *&c.* being laid in the uppermoſt of theſe, the earth is then waſhed from it into the reſt, by a rivulet turned upon it. When the water runs quite clear out of the baſons, they find the mercury and ſilver at bottom incorporated: this matter they call pella, and of this they form the pineas, by expreſſing as much of the mercury as they can, firſt by putting it in woollen bags, and preſſing and beating it thoroughly, then by ſtamping it in a kind of wooden mould, of an octagonal form, at bottom whereof is a braſs plate pierced full of little holes. The matter, being taken out of the mould, is laid on a trivet, under which is a large veſſel full of water, and the whole being covered with an earthen head, a fire is made around it. The mercury ſtill remaining in the maſs, is thus reduced into fumes, and at length condenſing, it is precipitated into the water, leaving behind it a maſs of ſilver grains, of different figures, which only joining or touching at the extremes, render the matter very porous and light. This then is the pinea, or pigne, which the workmen endeavour to ſell privately to the veſſels trading to the ſouth ſeas, and from which thoſe who have ventured to engage in ſo dangerous a commerce, have made ſuch vaſt gains.

PINEAL GLAND, in anatomy, a gland in the third ventricle of the brain, thus called from its reſemblance to a pine-apple. It is of a greyiſh colour, and its proceſſus and baſe are often medullary: this gland has often by many been ſuppoſed the peculiar ſeat of the ſoul. It is otherwiſe called conoides and conarion. See CONOIDES and CONARION.

PINES-ISLAND, a ſmall iſland on the north coaſt of Darien or Terra Firma in America, ſituated in weſt long. 80°, north lat. 9°.

PINGUEDO, in anatomy, the ſame with fat. See the article FAT.

PINGUICULA, BUTTER-WORT, in botany, a genus of the diandria-monogynia claſs of plants, the corolla whereof conſiſts of a ſingle ringent petal; the longer lip is ſtrait, obtuſe, trifid, and ſupine; the ſhorter lip is bifid, more obtuſe, and patent; the nectarium is of a cornicu-lated figure, and is produced from the baſis of the petal: the fruit is an oval capſule, compreſſed at the top, and containing only one cell, in which there are ſeveral ſmall ſeeds, of a cylindric figure, and a looſe receptacle.

PINGUIN, in botany, the name by which Dillenius calls the ananas. See the article ANANAS.

PINHEL, or PINTEL, a town of Portugal, in the province of Tralos montes, ſituated on the river Coa, weſt long. 7° 15′, north lat. 40° 50′.

PINION, in mechanics, an arbor, or ſpindle, in the body whereof are ſeveral notches, which catch the teeth of a wheel that ſerves to turn it round: or it is a leſſer wheel which plays in the teeth of a larger.

In a watch, *&c.* the notches of a pinion which are commonly 4, 5, 6, 8, *&c.* are called leaves, and not teeth, as in other wheels. For the pinions of a watch, and the leaves, turns, *&c.* thereof, ſee the article CLOCK.

Flying PINION. See FLYING *pinion*.

PINK, a veſſel uſed at ſea, maſted and rigged like other ſhips, only that this is built with a round ſtern; the bends and ribs compaſſing ſo as that her ribs bulge out very much. This diſpoſition renders the pinks difficult to be boarded, and alſo enables them to carry greater burdens than others, whence they are often uſed for ſtore ſhips, and hoſpital-ſhips, in the fleet.

PINK, *caryophyllus*, in botany, the engliſh name of ſeveral beautiful ſpecies of the dianthus. See DIANTHUS.

PINNA, a FIN; in natural hiſtory. See the article FIN.

PINNA, in anatomy. The lateral and inferior part of the noſe is called pinna naſi; and the ſuperior and broad part of the

the external ear is denominated pinna auris. See the articles EAR and NOSE.

PINNÆ MARINÆ, in the hiſtory of the ſhell-fiſh, a name given to ſeveral of the larger muſcles. See the article MUSCLE.

PINNACE, a ſmall veſſel uſed at ſea, with a ſquare ſtern, having ſails and oars, and carrying three maſts, chiefly uſed as a ſcout for intelligence, and for landing of men, *&c.* One of the boats belonging to a great man of war, ſerving to carry the officers to, and from, the ſhore, is alſo called the pinnace. See the article SHIP.

PINNACLE, in architecture, the top or roof of an houſe, terminating in a point. This kind of roof, among the antients, was appropriated to temples; their ordinary roofs were all flat, or made in the platform way. It was from the pinnacle that the form of the pediment took its riſe.

PINNATED LEAVES, *pinnata folia*, in botany, leaves formed in manner of a wing, and compoſed of two large ranges, or ſeries of foliola, annexed to the two ſides of one common, oblong petal. Of the pinnated leaves, however, there are ſeveral kinds. 1. The pinnated with an odd one: (plate CXCVII. fig. 3. n° 1.) this expreſſes the pinnated leaf, when beſide the two ſeries juſt mentioned, there is an odd leaf at the extremity of the petiole. 2. The pinnated without an odd leaf. *ibid.* n° 2. 3. The pinnated abrupt leaf, *ibid.* n° 3: this expreſſes a pinnated leaf, in which there is neither an odd leaf, nor a tendril at the end of the petiole. 4. The oppoſitely pinnated, which is when the folioles ſtand oppoſite to one another, on the common petiole, as in n° 2. 5. The alternately pinnated, when the folioles ſtand not oppoſite, but alternately, as in n° 1, 3. and 6. The interruptedly pinnated, in which the folioles are irregular and unequal in ſize and ſituation, *ibid.* n° 4. 7. The cirrhatedly pinnated, wherein the extremity of the petiole has one or more tendrils, inſtead of an odd leaf, *ibid.* n° 5. 8. The decurrently pinnated, in which the folioles extend beyond their proper baſe, in going down the petiole, and as it were, make it alated, *ibid.* n° 6. 8. The membranaceous pinnated, of the ſame form with the laſt, but with the petioles themſelves membranaceous and articulated, ibid. n° 7. 9. The conjugated pinnated leaf, when the whole compound leaf conſiſts only of two folioles, on the petiole, ibid. n° 8: this kind of pinnated leaf may be either abrupt cirrhated, membranaceous in the petiole, or ſtipulated. 10. Duplicato pinnatum, or pinnato-pinnatum, expreſſes a leaf compoſed of ſeveral others, each of which is itſelf compoſed of ſeveral ſmaller leaves, or foliola, ibid. n° 9. 11. Triplicato-pinnatum expreſſes a leaf, the petioles of which ſend out three alated ſubdiviſions, before it has any leaves on it, ibid. n° 10. Theſe laſt are terminated ſometimes by two foliola each, and in that caſe, are ſaid to be abrupt; ſometimes by an odd leaf, and are then called triplicato-pinnata cum impari.

PINNATUS, in heraldry, a term uſed by the latin writers upon that ſubject, to expreſs that ſort of line in arms, which is called, by our writers, the embattled line, or crenelle.

PINNEBURG, a town of Germany, in the circle of lower Saxony, and the dutchy of Holſtein, ſituated ten miles north of Hamburgh.

PINNING, in building the faſtening of tiles together, with pins of heart of oak, for the covering of an houſe, *&c.*

PINT, a veſſel, or meaſure uſed in eſtimating the quantity of liquids, and even ſometimes of dry things. See the article MEASURE.

PINTADO, in ornithology, the ſame with the meleagris, or turkey. See the article TURKEY.

PINTLE, among gunners, an iron, which ſerves to keep the gun from recoiling.

PINTLES, in a ſhip, are hooks by which the rudder hangs to the ſtern-poſt.

PINUS, in botany. See the article PINE.

PIOMBIONO, a city and port town of Italy, in the dutchy of Tuſcany, ſituated on a bay of the Tuſcan ſea, thirty miles ſouth of Leghorn.

PIONEER, in the art of war, a labourer employed in an army to ſmooth the roads, paſs the artillery along, and dig lines and trenches, mines, and other works.

PIONY, in botany. See PÆONIA.

PIP, or PEP, *Pepia*, a diſeaſe among poultry, conſiſting of a white thin ſkin, or film, that grows under the tip of the tongue, and hinders their feeding. It uſually ariſes from want of water, or from the drinking puddle-water, or eating filthy meat. It is cured by pulling off the film with the fingers, and rubbing the

the tongue with ſalt. Hawks are particularly liable to this diſeaſe, eſpecially from feeding on ſtinking fleſh.

PIPE, in building, &c. a canal, or conduit, for the conveyance of water and other liquids. Pipes for water, water-engines, &c. are uſually of lead, iron, earth, or wood: the latter are uſually made of oak or elder. Thoſe of iron are caſt in forges, their uſual length is about two feet and a half; ſeveral of theſe are commonly faſtened together by means of four ſcrews at each end, with leather or old hat between them, to ſtop the water. Thoſe of earth are made by the potters; theſe are fitted into one another, one end being always made wider than the other. To join them the cloſer, and prevent their breaking, they are covered with tow and pitch: their length is uſually about that of the iron-pipes. The wooden pipes are trees bored with large iron augres, of different ſizes, beginning with a leſs, and then proceeding with a larger ſucceſſively; the firſt being pointed, the reſt being formed like ſpoons, increaſing in diameter, from one to ſix inches or more: they are fitted into the extremities of each other, as repreſented in plate CCI. fig. 1. and are ſold by the foot.

Wooden pipes are bored as follows. The machine repreſented *ibid.* fig. 2. is put in motion by the wheel A, which is moved by a current of water; upon the axle of this wheel, is a cog-wheel, B, which cauſes the lanterns C, D, to turn horizontally, whoſe common axis is conſequently in a perpendicular direction. The lantern D, turns at the ſame time, two cog-wheels, E, and F; the firſt E, which is vertical, turns the augre which bores the wood, and the ſecond F, which is horizontal, cauſes the carriage bearing the piece to advance by means of the arms, H, I, which takes hold of the notches in the wheel, K. The firſt, H, by means of the notches, draws the wheel towards F, and the other, I, puſhes the under-poſt of the wheel, in an oppoſite direction; both which motions tend to draw the carriage towards F, and conſequently cauſe the augre to pierce the wood. The augre being from nine to twelve feet in length, and of a proportionable bigneſs, it will be neceſſary to have two pieces, as L, L, to ſupport its weight, and cauſe it to enter the piece to be bored with the ſame uniformity.

Leaden pipes are of two ſorts, the one ſoldered, the other not ſoldered: for the conſtruction of each ſort, ſee the article PLUMBERY.

It appears from what has been ſaid under the article FLUID, that we cannot only conduct water into pipes to very great diſtances, but bring it from one mountain to another, in pipes that go down into the interjacent vallies, and come up again, provided the reſervoir into which we bring the water, be ſomething lower than the ſpring from whence it comes, and whence the pipes begin: but it is neceſſary that we ſhould here take notice of ſome impediments that often ariſe in practice, and ſhow how to prevent or remedy them: the chief of theſe impediments ariſes from air in the pipes, by which the water is ſaid to be wind-bound; by theſe means, a pipe of two or three inches bore, will ſometimes not give more water than if it was but of one inch bore. The air may be diſcharged, and the pipe relieved, thus: Let A, B, C, D, *ibid.* fig. 3. be the ſpring from which a pipe is to bring water to the delivery at E, which ſuppoſe a mile from the ſpring. Now we will ſuppoſe E, to be a little lower than D; for example, four or five feet. If the ſurface of the water in the ſpring, comes down to the mouth of the pipe at D, or ſometimes near it, there will be a good deal of air that will run down with the water into the pipe; and wherever the ground riſes in the conduit of the pipe, this air will lodge itſelf in the upper parts of the pipe, as *a o m r*, and thereby diminiſh the water-way of the pipe, ſo as to force the water to paſs between *o* and *n*, a paſſage perhaps ten times leſs than the pipe when free. The way to clear the pipe of this air, is by going from D, along the pipe; when you come to the firſt riſing ground, drive a nail at the higheſt part of the pipe, as at *m*, ſo as to make a hole through it: then taking out the nail, the air will blow out violently, till at laſt the water ſucceeds the air: then let the hole be quite ſtopped up; and doing this at every eminence of the pipe, the whole air will be diſcharged, and the full quantity of water will be brought home at E. If the ſpring be very much higher than the place of delivery, the places of air in the pipe will not be juſt at the higheſt part of the pipe, but a little beyond it; becauſe the water running with greater velocity and force, drives the lodged air forward, as may

The manner of joining and laying the Pipes

The manner of joining, and letting the Air out of Conduit PIPES, with a Machine for boreing wooden Ones

T. Jefferys sculp

BRITISH MUSEUM

may be ſeen at *o p g*, which other ways would have been at *s*; and therefore the hole muſt be made beyond *s*. If the end E, be ſtopped for ſome time, ſo that the water may ceaſe to be in motion, the air will go back gradually, as appears at *u y w t*, where it may be let out.

But Dr. Deſaguliers propoſes to clear the pipes of air, by means of a ſmall pipe, which he calls a rider, laid over the eminent part of the main of a pipe, as *d e f*, *ibid.* fig. 4. communicating with the main at the top of the eminence, as at *e*, with a little branch and cock C, which being opened when the engine is working, the air, being puſhed forward, is catched at *d*, and diſcharged by the cock. The Dr. contrived an invention which he calls a Jack in the box, whereby air-cocks would open and ſhut of themſelves, by the running of water, and motion of the air only. This contrivance is deſcribed in the philoſophical tranſactions, n° 393.

The ſeveral impediments, water in conduit-pipes, meets with from friction, preſſure, *&c.* and the methods of remedying them, have already been taken notice of under the articles FLUID and FOUNTAIN.

PIPES *of an organ.* See the article ORGAN.

Bag-PIPE. See the article BAGPIPE.

Tobacco-PIPE, a machine uſed in the ſmoaking of tobacco, conſiſting of a long tube, made of earth or clay, having at one end a little caſe, or furnace, called the bowl, for the reception of the tobacco, the fumes whereof are drawn by the mouth through the other end. Tobacco-pipes are made of various faſhions; long, ſhort, plain, worked, white, varniſhed, unvarniſhed, and of various colours, *&c.* The Turks uſe pipes three or four feet long, made of ruſhes, or of wood bored, at the end whereof they fix a kind of a pot of baked earth, which ſerves as a bowl, and which they take off after ſmoaking.

PIPE alſo denotes a veſſel or meaſure for wine, and things meaſured by wine-meaſure. See the article MEASURE.

PIPE, in mining, is where the ore runs forwards end-ways in a hole, and doth not ſink downwards, or in a vein.

PIPE, *pipa*, in law, is a roll in the exchequer, called alſo the great roll. See the next article.

PIPE-OFFICE is an office wherein a perſon called the clerk of the pipe, makes out leaſes of crown-lands, by warrant from the lord-treaſurer, or commiſſioners of the treaſury, or chancellor of the exchequer. The clerk of the pipe makes out alſo all accounts of the ſheriffs, *&c.* and gives the accomptants their quietus eſt. To this office are brought all accounts which paſs the remembrancer's office, and remain there, that if any ſtated debt be due from any perſon, the ſame may be drawn down into the great roll of the pipe; upon which the comptroller iſſues out a writ, called the ſummons of the pipe, for recovery thereof; and if there be no goods or chattels, the clerk then draws down the debts to the lord treaſurer's remembrancer, to write eſtreats againſt their lands. All tallies which vouch the payment of any ſum contained in ſuch accounts, are examined and allowed by the chief ſecondary of the pipe. Beſides the chief clerk in this office, there are eight attornies, or ſworn clerks, and a comptroller.

PIPER, PEPPER, in botany. See PEPPER.

PIPER, in ichthyology, a ſpecies of trigla, with a bifid roſtrum, and tubuloſe noſtrils. See the article TRIGLA.

The head of this ſpecies is very large in proportion to the body; the mouth is remarkably wide; the eyes are large, and ſtand at a very ſmall diſtance from each other at the top of the head, and are covered with a ſkin; the bony covering of the head is angulated, and terminates in two horns at the hinder part; the roſtrum is formed into ſpines, and at the upper part of the orbits of the eyes there is alſo a robuſt and crooked ſpine; the body is ſomewhat rounded, and of a conic figure, very large towards the head, and extremely ſmall at the tail; over each of the pectoral fins there ſtands a very robuſt and ſharp thorn, and there are on each ſide three articulated appendages: this fiſh grows to more than a foot in length: and, when caught, it makes a ſingular and loud noiſe.

PIPERNO, a town of Italy, in the territory of the pope, and Campania of Rome, ſituated fifty miles ſouth-eaſt of Rome, in the way to Naples.

PIPLEY, a port town of India in Aſia, ſituated on the weſt ſide of the bay of Bengal, in eaſt longit. 86°, and north lat. 21°.

PIQUETE. See PICKET and PICQUET.

PIQUETTE, among floriſts, a term uſed for a certain ſort of carnations, which have always a white ground, and are ſpotted,

or, as they call it, pounced with ſcarlet, red, purple, and other colours.

PIQUIGNI, a town in France, of the province of Picardy, ſituated on the river Somme, ſeven miles eaſt of Amiens.

PIRANO, a port town of Iſtria, in the territory of Venice, ſituated on a bay in the gulph of Venice, ten miles ſouth of Cabo d'Iſtria.

PIRATE, PYRATE, or ROVER, *pirata*, a perſon, or veſſel, that robs on the high ſeas, without permiſſion or authority of any prince or ſtate.

When a pirate enters into any port or haven, and there robs a merchant's ſhip, this is not held to be piracy, becauſe it is not done on the high ſea, but it is a robbery at the common law. In caſe a ſhip is riding at anchor on the ſea, and it happens that the mariners or ſeamen are part in their boat, and the reſt on ſhore, by which accident none are left in the ſhip; here, if a pirate ſhall attack her, and commit a robbery, the ſame is piracy. Nevertheleſs, the taking, by a ſhip at ſea, in great neceſſity of victuals, cables, ropes, &c. ſuch things out of another veſſel, is not ſo, where that other veſſel can ſpare ſuch things, and the takers pay or give ſecurity for them. The manner of trying a pirate, is by a ſpecial commiſſion, directed to the lord high admiral, &c. and the offence of piracy may be heard and determined, as if the robbery was committed on land; and offenders ſhall ſuffer the like pains of death, loſs of lands and goods, &c. Perſons combining to yield up ſhips to pirates, or to lay violent hands on the commanders of ſhips, or that correſpond with any pirate, are adjudged guilty of piracy. All the proper goods of pirates are granted to the lord high admiral by patent; but not their piratical goods, which, where the owner is not known, belong to the king.

PIRITZ, a town of Germany, in the circle of Upper Saxony, and the dutchy of Pomerania, ſituated fifteen miles ſouth of Stetin.

PIROUETTE, or PYROET, in the manege, a turn or circumvolution, which a horſe makes without changing his ground. Pirouettes are either of one tread or piſte, or of two. The firſt is an entire ſhort turn which the horſe makes upon one tread, and almoſt in one time, in ſuch manner as that his head comes to the place where his tail was, without putting out his haunches. In the pirouette of two treads or piſtes, he takes a ſmall compaſs of ground, almoſt his length, and marks both with the fore-part and the hind.

PISA, a city of Italy, in the dutchy of Tuſcany, ſituated on the river Arno, four miles eaſt of the ſea, and ten miles north of Leghorn.

PISCA, a port-town of Peru, in ſouth America, ſituated in the province of Lima: weſt long. 76°, ſouth lat. 14°.

PISCARY, *piſcaria*, in our antient ſtatutes, the liberty of fiſhing in another man's waters.

PISCATAWAY, a harbour of New Hampſhire, in America, ſituated in weſt long. 70°, and north lat. 43° 35′.

PISCES, in aſtronomy, the twelfth ſign or conſtellation of the zodiac. The ſtars in piſces, in Ptolemy's catalogue, are 38; in Tycho's, 33; and in the Britannic, catalogue 109.

PISCINA, in antiquity, a large baſon in a public place or ſquare, where the roman youth learned to ſwim, and which was ſurrounded with a high wall, to prevent caſting of filth into it.

It alſo ſignifies a lavatory among the Turks, placed in the middle court of a moſque or temple, where the muſſulmans waſh themſelves before they offer their prayers. See ABLUTION.

PISCIS AUSTRALIS, in aſtronomy. See the article AUSTRAL.

PISCIS VOLANS, in aſtronomy, a ſmall conſtellation of the ſouthern hemiſphere unknown to the antients, and inviſible to us in theſe northern regions.

PISONIA, in botany, a genus of the dioecia-pentandria claſs of plants, the corolla whereof is of an infundibuliform ſhape; the tube is ſhort; the limb is ſemiquinquifid acute and patulous; the fruit is an oval quinquangular capſule, formed of five valves, and containing only one cell; the ſeed is ſingle, ſmooth, and ovato oblong.

PISSASPHALTUM, EARTH-PITCH, in natural hiſtory, a fluid, opake, mineral body, of a thick conſiſtence, of a ſtrong ſmell, readily inflammable, but leaving a reſiduum of greyiſh aſhes after burning. It ariſes out of the cracks of rocks, in ſeveral places in the iſland of Sumatra, and in ſome other parts of the Eaſt Indies, and is much eſteemed there, in paralytic diſorders. It is greatly recommended by the antients as an emollient, maturant, and digeſtive, and was uſed in cataplaſms for ripening all ſorts of tu-

mours.

BRITISH MUSEUM

Fig. 1. PISTONS.

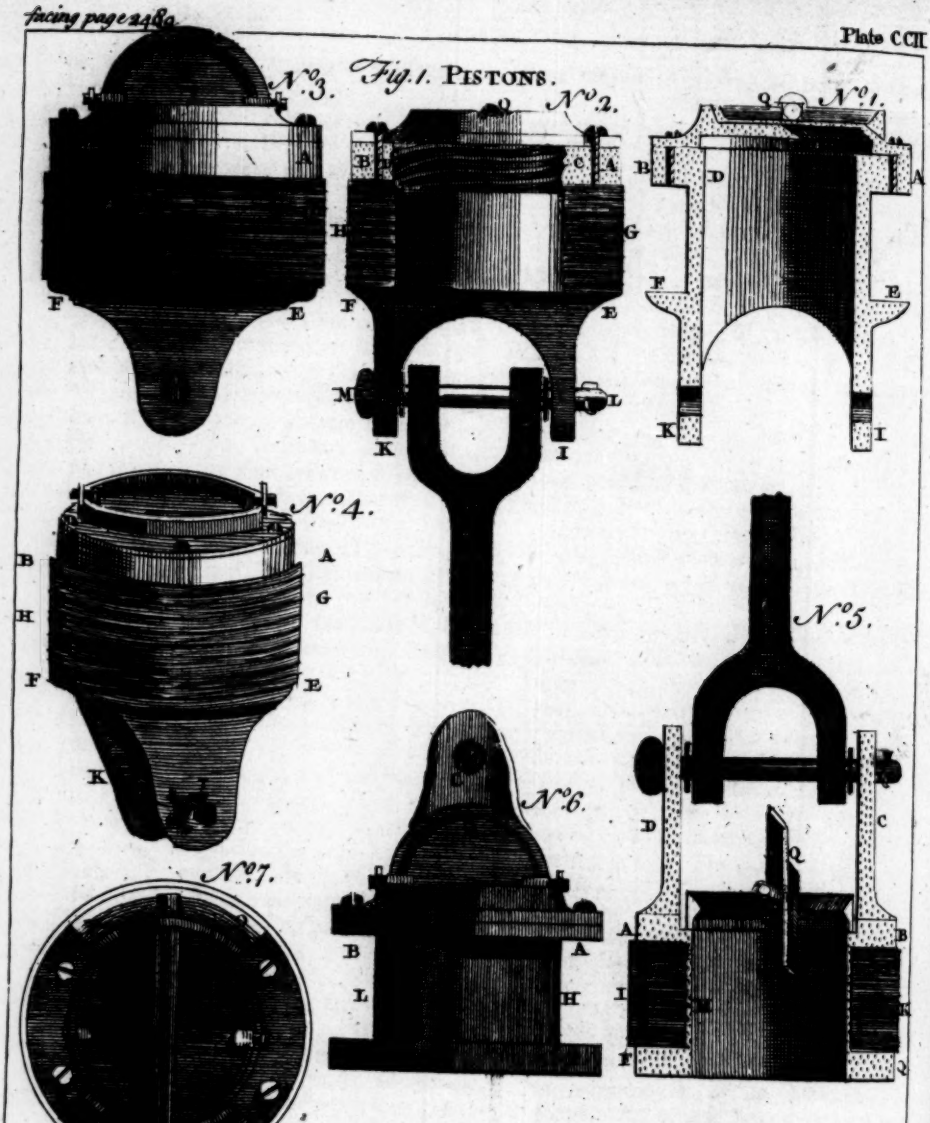
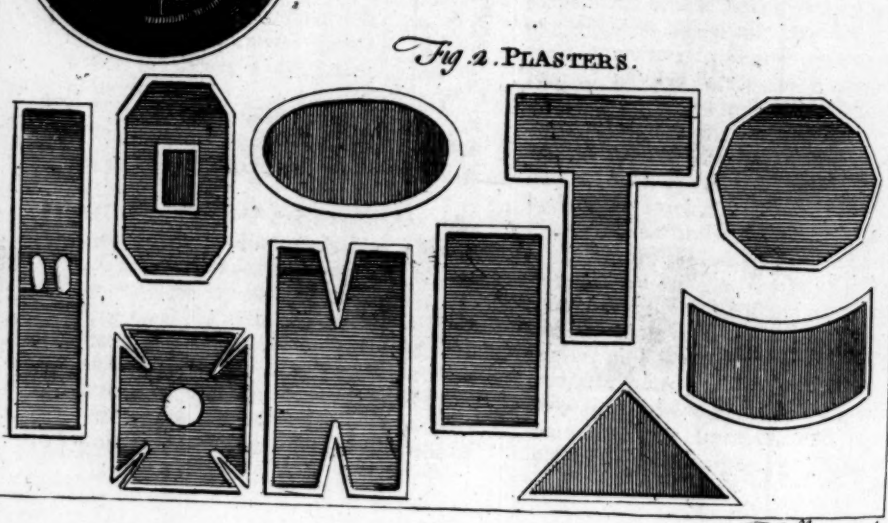


Fig. 2. PLASTERS.



J. Jefferys sculp

mours, and againſt the ſciatica, and other pains of the limbs.

PISSELÆUM INDICUM, BARBADOES-TAR, in natural hiſtory, a mineral fluid, of the nature of the thicker bitumens, and of all others the moſt approaching, in appearance, colour, and conſiſtence, to the true piſſaſphaltum, tho' differing from it in other reſpects. It is very frequent in many parts of America, where it is found trickling down the ſides of mountains in large quantities, and ſometimes floating on the ſurface of the waters: but it ſeems to be almoſt loſt at this time in the iſland of Barbadoes, from whence it was originally named. It has been greatly recommended internally in coughs and other diſorders of the breaſt and lungs; but it is ſeldom to be met with genuine.

PISTACIA, in botany, a genus of the dioecia-pentandria claſs of plants, having no corolla; the fruit is a dry roundiſh drupe, and the ſeed is an oval ſmooth nut. This genus comprehends the maſtich-tree, the turpentine-tree, and the piſtachia-nut-tree.

Piſtachia-nuts abound with a ſweet and well-taſted oil, which they will yield in great abundance, on being preſſed after bruiſing them: they are reckoned wholeſome and nutritive, and are very proper to be preſcribed by way of reſtoratives, eaten in a moderate quantity, and to people emaciated with long illneſſes. They are recommended as peculiarly good to prevent obſtructions of the liver.

PISTE, in the manege, the tread or track a horſe makes upon the ground he goes over. The piſte of a horſe may be either ſingle or double: if the rider makes him go but an ordinary gallop in a circle, or rather ſquare, he will make but a ſingle piſte; if he makes him gallop with his haunches in, he will make two piſtes, one with the fore part, another with the hind. And the ſame, if the rider makes him paſſage, or go ſide-ways, either in a ſtraight line, or upon a circle.

PISTIA, in botany, a genus of the gynandria-hexandria claſs of plants, the corolla whereof conſiſts of a ſingle, unequal, cucullated, turbinated petal: the fruit is a roundiſh capſule, attenuated at the baſe, containing ſix cells, and a few truncated ſeeds.

PISTIL, among botaniſts, denotes the female organ of generation in plants; it conſiſts of three parts, the germen, ſtyle, and ſtigma; the germen ſupplies the place of an uterus in plants, and is of various ſhapes, but always ſituated at the bottom of the piſtil, and contains the embryo-ſeeds: the ſtyle is a part of various forms alſo, but always placed on the germen: and the ſtigma is alſo of various figures, but always placed on the top of the ſtyle, or, if that be wanting, on the top of the germen.

PISTOJA, a town of Tuſcany, twenty-miles north-weſt of Florence.

PISTOL, the ſmalleſt piece of fire-arms, borne at the ſaddle-bow, on the girdle, and in the pocket.

PISTOLE, a gold-coin, ſtruck in Spain, and in ſeveral parts of Italy, Switzerland, &c. See the article COIN.

The piſtole has its augmentations and diminutions, which are quadruple piſtoles, double piſtoles, and half-piſtoles.

PISTON, *embolus*, in pump-work, is a ſhort cylinder of metal, or other ſolid ſubſtance, fitted exactly to the cavity of the barrel or body of the pump.

Here follows an account of Mr. Belidor's piſtons or buckets, which are either lifting or ſucking. The lifting piſton conſiſts of a ſhort hollow cylinder CDIK (plate CCII. fig. 1. n° 1, 2, 3, 4.) which has at bottom two ears, or handles, cut from the cylinder, as EI, FK, with a hole through each, which is to receive a ſtrong pin ML (n° 2.) to join it to its lifting rod PNO. This cylinder has a broad ſhoulder EF, ſtanding out to ſtop ſeveral rings of leather, which are ſlipped upon the cylinder, as you may ſee at GH (n° 2, 3.) There is at the upper end a male ſtrew CD, to receive the female one AB. Upon the face or flat of this ſcrew is faſtened, with ſmall ſcrews, and a leather between, the valve Q; the deſcription of which will be given under the article VALVE.

In the ſucking piſtons (*ibid.* n° 5, 6, 7.) the valves are not ſcrewed to the pieces that hold and ſqueeze the leathers FG (by AB in the former piſtons); but are faſtened between the handles C, D, by means of ſmall ſcrews, upon a return of the cylinder. Q (n° 5.) ſhews the valve upright upon its bed; HL, the hollow of the cylinder; and IK, the leathers. The handle here is at top, with its rod and center-pin. N° 6. *ibid.* repreſents the piſton with only one of its handles at C; the other being taken off, the better to ſhew the valve upright and in front at Q. AB is the return of the cylinder on which

which the bed of the valve is ſcrewed; and HL, the place of the leathern rings. N° 7. *ib.* ſhews the piſton viewed downwards, from the center-pin that goes through the handles OP, OP, but the rod is off; MM, NN, are the places where the bed of the rod is ſcrewed, and Q is the valve ſhut.

Theſe piſtons require to be very exactly turned in a lathe, and the barrels in which they work to be nicely bored, otherwiſe they will not be tight. However, if a thin leather be folded upwards at AB (n° 5.) and another folded downwards at FG, they will do pretty well, notwithſtanding ſome irregularities: ſuch leathers may be ſeen in our deſcription of the forcing-pump. See the articles FORCER and PUMP.

PISUM, the PEA, in botany, a genus of the diadelphia-decandria claſs of plants, with a tetrapetalous papilionaceous flower; its fruit is a large, unilocular, and bivalve pod, containing ſeveral globoſe ſeeds.

Peas are nutritive, and accordingly uſed for food, but rarely for any medicinal purpoſes, except to keep iſſues open; for which purpoſe they are rubbed with baſilicon, or linimentum Arcæi.

There is alſo a medicinal compoſition called piſa, from its being made up in the form of peas. The yellow kind, piſa lutea, is made of yellow ochre, half an ounce; florentine orrice-root, two drams; yellow bees-wax, one ounce; and venice turpentine, as much as is ſufficient to make them into peas: theſe are intended to promote the running of iſſues, as they draw more than common white peas. There is alſo a red kind, made of vermilion, half an ounce; hermodactyls, two drams; yellow bees-wax, ſix drams; which are to be formed into peas with turpentine.

PIT *of a theatre*, all that ſpace between the amphitheatre or galleries, and theatre or ſtage, called by the antients orcheſtra. See the article ORCHESTRA.

Brine-PITS, the name given by the people of Worceſterſhire and Cheſhire to the wells or pits affording ſalt-water, out of which they extract the ſalt. See SALT.

PITCH, a tenacious oily ſubſtance, drawn chiefly from pines and firs, and uſed in ſhipping, medicine, and various other arts: or it is more properly tar, inſpiſſated by boiling it over a ſlow fire.

The method of procuring the tar, is by cleaving the trees into ſmall billets, which are laid in a furnace that has two apertures, through one of which the fire is put, and through the other the pitch is gathered, which, ouzing from the wood, runs along the bottom of the furnace into places made to receive it. When the ſmoke, which is here very thick, gives it its blackneſs; this is called tar, which, on being boiled, to conſume more of its moiſture, becomes pitch. See TAR.

There is another method of drawing pitch, uſed in the Levant: a pit is dug in the ground, two ells in diameter at the top, but contracting as it grows deeper; this is filled with branches of pine, cloven into ſhivers; the wood at the top of the pit is then ſet on fire, and burning downwards, the tar runs from it, out of a hole made in the bottom; and this is boiled, as above, to give it the conſiſtence of pitch.

Pitch acquires different names, according to its different preparations, colours, and qualities: as it diſtils from the wood, it is called barras; but afterwards it aſſumes a double name, the fineſt and cleareſt being called galipot, and the coarſer marbled barras. Of the galipot is made what is called white pitch, or burgundy pitch, which is nothing but the galipot melted with oil of turpentine; though ſome will have it a native pitch, diſtilling from a reſinous tree growing in the mountains of Franche Comte.

Pitch from the britiſh plantations pays on being imported, a duty of 9 s. $7\frac{1}{2}$ d. for every laſt, containing twelve barrels, and draws back on exportation 8 s. $5\frac{1}{2}$ d. For every twelve barrels not from the britiſh plantations, on importation, 10 s. $9\frac{56\frac{1}{2}}{100}$ d. and draws back, on exportation, 9 s. $7\frac{31\frac{1}{2}}{100}$ d.

PITH, in vegetation, the ſoft ſpungy ſubſtance contained in the central parts of plants and trees. As the ſubſtance of the trunk in trees, ſays Boerhaave, becomes more woody, the pith is compreſſed, and ſtraitened to ſuch a degree, that it wholly diſappears. It is plain from this, that the office of the pith in vegetation, cannot be very great, ſince it is not of perpetual duration. By its ſpungy ſtructure, it ſeems fitted to receive any ſuperfluous moiſture, that might tranſude through the pores of the woody fibres. If, by the exceſs of ſuch moiſture, or from any other cauſe, it happens to rot and periſh, as frequently happens in elms, the

the tree is found to grow full as well without it; a proof it is of no eſſential uſe in vegetation.

PITHA, a port-town of Sweden, capital of the province of Pitha-Lapmark, ſituated on the weſt ſide of the Bothnic gulph; eaſt long. 20°, north lat. 64° 45'.

PITTANCE, *pietantia*, a word chiefly uſed among religious, and thoſe who live in a community, ſignifying the commons, or allowance of meat, be it fiſh, fleſh, or the like, ſtatedly eaten at meals, beſides bread.

PITTENWEEM, a port-town of Scotland, in the county of Fife, at the entrance of the Firth of Forth, twenty-three miles north-eaſt of Edinburgh.

PITUITA. See PHLEGM and SALIVA.

PITUITARY GLAND, in anatomy, a gland in the brain, of the ſize of a very large pea, placed under the cella of the os ſphenoides, under the infundibulum, wherewith it communicates, receiving from it a lymph or a juice, which the infundibulum derives from the plexus choroides and pineal gland; and from this lympha does the gland itſelf take its name. It alſo filtrates a juice itſelf, ſeparating from the blood a white liquor, very ſubtile, and apparently very ſpirituous.

PIVAT, or PIVOT, a foot or ſhoe of iron, or other metal, uſually conical, or terminating in a point, whereby a body, intended to turn round, bears on another fixed at reſt, and performs its circumvolutions. The pivot uſually bears or turns round in a ſole, or piece of iron or braſs, hollowed to receive it.

PLACAGNOSCIERIA, in natural hiſtory, the name of a genus of ſpars. See the article SPAR.

The bodies of this genus are dull and opake, cryſtalline, terrene ſpars, formed into cruſts, and of an irregular and not ſtriated texture within. Of this genus there are three known ſpecies. 1. A hard, whitiſh brown one, found very frequently on the roofs and ſides of caverns on Mendip-hills, and in other parts of England. 2. A dull, crumbly, whitiſh one, found in many parts of England, encruſting the ſides of caverns, and of fiſſures of ſtone. And, 3. A dull, pale-brown one, of a very coarſe texture. This is the moſt common of all the bodies of this genus, and is found in variety of forms; among others, encruſting the ſides and bottoms of our tea-kettles, and other veſſels, in which water is frequently boiled.

PLACARD, or PLACART, among foreigners, ſignifies a leaf or ſheet of paper, ſtretched out, and applied on a wall or poſt, containing edicts, regulations, &c. Among us, placard ſignifies a licence, whereby a perſon is permitted to uſe unlawful games, &c.

PLACARD, in architecture, denotes the decoration of the door of an apartment, conſiſting of a chambranle, crowned with its frieze or gorge, and a corniche, ſometimes ſupported by conſoles. See the article DOOR.

PLACE, *locus*, in philoſophy, a mode of ſpace, or that part of immoveable ſpace which any body poſſeſſes. See SPACE.

Place is to ſpace or expanſion, ſays Mr. Locke, as time is to duration. Our idea of place is nothing but the relative poſition of any thing with reference to its diſtance from ſome fixed and certain points. Whence we ſay, that a thing has or has not changed place, when its diſtance either is or is not altered with reſpect to thoſe bodies with which we have occaſion to compare it. That this is ſo, continues that great philoſopher, we may eaſily gather from hence, that we have no idea of the place of the univerſe, though we can of all its parts. To ſay that the world is ſomewhere, means no more than that it does exiſt: however, the word place is ſometimes taken to ſignify that ſpace which any body takes up; and in this ſenſe, according to the ſame author, the univerſe may be conceived in a place: but he thinks that this portion of infinite ſpace poſſeſſed by the material world, might more properly be called extenſion.

Ariſtotle, and his followers, conceive place to be the immoveable and contiguous concave ſurface of an ambient body; ſo that, as Mr. Boyle obſerves, it is a kind of veſſel, which every way contains the body lodged in it; only with this difference, that a veſſel is a kind of moveable place: hence it has been uſually affirmed, that what is in no place, is not at all: yet it appears not, ſays the laſt mentioned author, how the outermoſt heaven can be called a place, ſince theſe philoſophers aſſerting the world to be finite, muſt grant there is no ambient body without it to contain it; and if the outermoſt heaven ſhould be impelled by the power of God in a ſtraight line, this or that way, there would enſue a motion without a change of place; for the outermoſt heaven which

was

was in none before, and does not by its progreſſion come to be contained by a new ambient body, and, in this caſe, even according to the favourers of Ariſtotle, who approve Des Cartes' definition of local motion, the world may be ſaid to move without changing place; for it does not paſs from the neighbourhood of ſome bodies to that of others; ſince compriſing all bodies, and yet being bounded, there is no body for it to leave behind, nor any beyond for it to approach. See the article MOTION.

Ariſtotle divides ſpace into external and internal; the firſt being that already conſidered, includes or contains the body; and the other, that ſpace or room which the body contains. But Sir Iſaac Newton better and more intelligibly diſtinguiſhes place into abſolute and relative; abſolute or primary place being that part of infinite and immoveable ſpace which a body poſſeſſes; and relative or ſecondary place being the ſpace it poſſeſſes, conſidered with regard to the other adjacent bodies.

Optical PLACE, the point to which the eye refers an object.

The optical place of a ſtar is a point of the ſurface of the mundane ſphere, wherein a ſpectator ſees the center of a ſtar. See the article PARALLAX.

PLACE *of radiation*, is the ſpace in a medium or tranſparent body through which any viſible object radiates.

The place of the ſun, ſtar, *&c.* alſo denotes the ſign and degree of the zodiac which the luminary is in; or the degree of the ecliptic, reckoning from the beginning of aries, which the planet or ſtar's circle of longitude cuts; and therefore coincides with the longitude of the ſun, planet, or ſtar. As the ſine of the ſun's greateſt declination 23° 30′: to the ſine of any preſent declination given or obſerved, for inſtance, 23° 15′:: ſo is the radius 10: to the ſine of his longitude 81° 52′; which, if the declination were north, would give 20° 52′ of gemini; if ſouth 20° 52′ of capricorn for the ſun's place. See DECLINATION, *&c.*

The place of the moon being that part of her orbit wherein ſhe is found at any time, is of various kinds, by reaſon of the great inequalities of the lunar motions, which render a number of equations and reductions neceſſary before the juſt point be found. The moon's fictitious place is her place once equated; her place nearly true, is her place twice equated; and her true place is her place thrice equated. See the article MOON.

Excentric PLACE *of a planet*. See the article EXCENTRIC.

Geocentric PLACE *of a planet*. See the article GEOCENTRIC.

Heliocentric PLACE *of a planet*. See the article HELIOCENTRIC.

PLACE, in geometry. See LOCUS.

PLACE, in war, a general name for all kinds of fortreſſes where a party may defend themſelves: thus, 1. A ſtrong or fortified place, is one flanked, and covered with baſtions. 2. A regular place, one whoſe angles, ſides, baſtions, and other parts, are equal; and this is uſually denominated from the number of its angles, as a pentagon, hexagon, *&c.* 3. Irregular place, is one whoſe ſides and angles are unequal. 4. Place of arms, is a ſtrong city or town pitched upon for the chief magazine of an army; or, in a city or garriſon, it is a large open ſpot of ground, uſually near the center of the place where the grand guard is commonly kept, and the garriſon holds its rendezvous at reviews; and in caſes of alarm to receive orders from the governor. 5. Place of arms of an attack, in a ſiege, is a ſpacious place covered from the enemy by a parapet or epaulement, where the ſoldiers are poſted ready to ſuſtain thoſe at work in the trenches againſt the ſoldiers of the garriſon. 6. Place of arms particular, in a garriſon, a place near every baſtion where the ſoldiers ſent from the grand place to the quarters aſſigned them, relieve thoſe that are either upon the guard or in ſight. 7. Place of arms without, is a place allowed to the covert-way for the planting of cannon, to oblige thoſe who advance in their approaches to retire. 8. Place of arms in a camp, a large place at the head of the camp for the army to be ranged in and drawn up in battalia. There is alſo a place for each particular body, troop, or company, to aſſemble in. See the articles CAMP, TROOP, *&c.*

PLACE, in logic and oratory, denotes the ſeat or ſource of an argument, of which there are two kinds, inartificial and artificial; the firſt is the place of teſtimony, authority, *&c.* the ſecond, that of reaſon, as when we argue from univerſals, cauſes, *&c.*

Common PLACE. See COMMON PLACE.

PLACENTA, in anatomy, a ſoft roundiſh maſs found in the womb of pregnant women;

women; which from its reſemblance to the liver, was called by the antients hepar uterinum, the uterine liver.

The number of placentæ in human ſubjects, anſwers to that of the fœtuſes; and as theſe are uſually ſingle, the placenta is uſually ſo too: but when there are two or more fœtuſes, there are always as many placentæ; yet in this caſe they often cohere together ſo as to ſeem but one; but even in this caſe, their veſſels do not communicate from one to the other.

The placenta is about eight or nine inches in diameter, and about an inch in thickneſs. Its convex and ſpongy part is connected to the uterus, by means of a very thin and fine membrane, which is reticulated, villoſe, and continuous with the chorion. Its concave part is turned towards the fœtus, and ſhews a multitude of very large veſſels: it is joined to the navel-ſtring, and ſurrounded with a ſmooth membrane from the chorion and amnios. It has no certain part of the uterus to adhere to; but is uſually fixed to its bottom. Its ſubſtance, according to Ruyſch and Heiſter, is truly vaſcular, or compoſed ſolely and entirely of the umbilical veins and arteries, interwoven in a very curious manner.

The placenta has generally been looked upon as an original part among the ſecundines; but according to Dr. Thomas Simſon of St. Andrews, it ſeems to have no place in the ovarium, nor in the uterus, till once the ovum becomes contiguous to the fundus, and then every contiguous part becomes really a placenta. He thinks the fundus uteri a place peculiarly fitted for the growth of the placenta, as proper ſoils encourage the growth of the roots of trees and ſhrubs, many of which are propagated by the branches however placed: ſo that every part of them ſeems equally fitted to be root or branch. Hence he thinks extra-uterine conceptions can have no placenta; and he ſays, there are no inſtances in authors to contradict his opinion. The placenta, according to Dr. Monro of Edinburgh, does not increaſe in the ſame proportion which the fœtus does; for the ſmaller the fœtus is, the placenta is proportionally larger. The placenta generally adheres to, or near, the fundus of the womb, and is covered on the ſide next to the womb, with a fine membranous continuation of the chorion. The ſeparation of the placenta from the womb muſt produce abortions, and this may be occaſioned by different cauſes operating in various manners, and requires very different treatment to prevent the loſs of the fœtus.

The uſe of the placenta is, together with the chorion, to abſorb the nutritious juice from the mother's uterus, as the inteſtines do the chyle; and finally to tranſmit it to the fœtus, by means of the umbilical veins. And it probably ſerves to refund again to the parent, the blood and urine of the fœtus, by the umbilical arteries.

PLACENTA is alſo a term uſed, by ſome botaniſts, for what is more uſually called the receptacle of the ſeeds. See the article RECEPTACULUM SEMINUM.

PLACENTIA, a city of Spain, in the province of Eſtramadura: weſt long. 6°, north lat. 39° 45′.

PLACENTIA, a town of Spain, in the province of Guipuſcoa, forty miles eaſt of Bilboa.

PLACENTIA, a port town of Newfoundland, ſituated on a bay on the ſouth-eaſt part of the iſland: weſt long. 56°, north lat. 48°.

PLACENTIA, or PIACENZA, a city of Italy, in the dutchy of Parma: eaſt long. 10° 25′, north lat. 45°.

PLACITA, PLEAS, in a law-ſenſe. See the article PLEA.

PLACITUM, in law, a ſentence of a court, or an opinion, decree, or ordinance.

PLAFOND, or PLAFOUND, in architecture, the ceiling of a room, whether it be flat or arched, lined with plaſter or joiner's work, and frequently enriched with painting.

The word plafond is alſo more particularly uſed for the bottom of the projecture of the larmier of the corniche, called alſo ſoffit. See the article SOFFITA.

PLAGIARY, in philology, the purloining another perſon's works, and putting them off for a man's own. Among the Romans, plagiarius was properly a perſon who bought, ſold, or retained a freeman for a ſlave; and was ſo called, becauſe by the Flavian law ſuch perſons were condemned, ad plagas, to be whipped.

PLAGIURI, among ichthyologiſts, one of the claſſes of fiſhes; comprehending all thoſe which have the tails not perpendicular, but placed in an horizontal direction; and ſuch are all the cetaceous fiſhes, and they only, as the phyſeter, dolphin, monodon, catodon, and thrichechus. See PHYSETER, &c.

PLAGUE, PESTILENCE, or PESTILENTIAL FEVER, a moſt acute fever, ariſing from a poiſonous miaſma, brought from oriental countries, which, unleſs it is immediately expelled out of the body, by the ſtrength of the vital motions, by buboes and carbuncles, proves fatal.

In this, as well as in moſt contagious diſeaſes, ſays Hoffman, the venomous miaſma is ſwallowed with the air, and inſinuates itſelf into the ſalival juice; whence it aſſaults the head, brain, nerves, and animal ſpirits; producing a torpor in the head, a heavineſs, a ſleepineſs, a violent pain, a ſtupor of the ſenſes, a forgetfulneſs, inquietude, watching, and loſs of ſtrength. From the fauces it proceeds to the ſtomach, creating a loathing of food, nauſeas, anxiety of the precordia, a cardialgia attended with fainting, reaching to vomit, and vomiting itſelf. Hence it proceeds to the membranes of the ſpinal marrow, the coats of the arteries, producing horrors, a languid, ſmall, contracted, quick pulſe, and even fainting. All which are generally ſigns and ſymptoms of the plague, which are of a more violent and quick operation in proportion to the virulence of the peſtilential miaſma. This diſeaſe differs from other contagious, malignant, and eruptive fevers, becauſe it is the moſt acute, and ſometimes kills on the firſt, and ſometimes on the ſecond day. In our climate it is not epidemic or ſporadic, from a bad way of living, or an unhealthful air, but happens when it is moſt ſalutary, from contagion alone, and is imported from hot countries where this diſeaſe rages. It will not only abate by intenſe cold, but be perfectly extinguiſhed; wherefore in a cold ſeaſon and very cold countries, it either does not appear at all, or in a very mild degree; whereas if the climate is hot, it is not only moſt violent, but moſt common.

All plagues are not of the ſame nature, but vary according to different conſtitutions and circumſtances; but all who have written of the plague univerſally agree, that ſpongy and porous bodies, of an obeſe habit, of a ſanguine and phlegmatico-ſanguine conſtitutions, women, young perſons and children, perſons of a timid diſpoſition, that are poor, live hard, or are given to luxury, and ſit up late at night, are more apt to be afflicted with this diſeaſe than the ſtrong and intrepid, lean, nervous, endued with large veſſels, men, old perſons obnoxious to the hæmorrhoidal flux, and who have iſſues and open ulcers. Nothing brings on this diſtemper ſooner than fear, a dread of death, and a conſternation of the mind. If the peſtilential poiſon is not expelled to the external parts, it is certainly fatal; nor is this to be done, according to Hoffman, as in other fevers, by large ſweats, by ſtools, by a flux of urine, by bleeding at the noſe, either natural or artificial: for theſe threaten deſtruction. The ſalutary and critical excretion which perfectly ſolves the peſtilential diſeaſe, is by tumours in the ſurface of the body, not otherwiſe than the eryſipelas, between the third and fourth day, and the ſooner the better, becauſe then the ſymptoms are mitigated. That there is poiſon contained in theſe tumours appears from hence, that if the ſurgeon opens any of the tumours with his lancet, and then bleeds a ſound man with the ſame, he will be immediately ſeized with the plague. The peſtilential tumours are of two kinds, the firſt ariſes in the glandulous places, moſt commonly in the groin and arm-pits; ſometimes in the parotid and mammary glands, as alſo the lower maxillary, and in thoſe near the aſpera arteria. The deſcription and treatment of theſe tumours, may be ſeen under the article *Peſtilential* BUBO.

The other ſort is the anthrax, or carbuncle, and is already treated of under the article CARBUNCLE.

As in the ſmall-pox the management conſiſts in clearing the primæ viæ in the beginning, in regulating the fever, and in promoting the natural diſcharges; ſo in the plague, the ſame indications will take place. When the fever is very acute, a cool regimen is neceſſary: but when the pulſe is languid, and the heat not exceſſive, moderate cordials muſt be uſed. The moſt gentle emetics may be given; the beſt is ipecacuhana, if the ſtomach or bowels are not inflamed, for in that caſe certain death may be expected. In France they bleed about twelve ounces on the firſt day, and then four or five ounces every two hours after. This, they ſay, had extraordinary ſucceſs with the aſſiſtance only of cooling ptiſans, and ſuch like drinks, which they gave plentifully at the ſame time. Sydenham adviſes, that ſweating be continued without intermiſſion. Dr. Mead recommends an infuſion of virginia ſnake-root in boiling water, as the moſt proper ſu-

dorific;

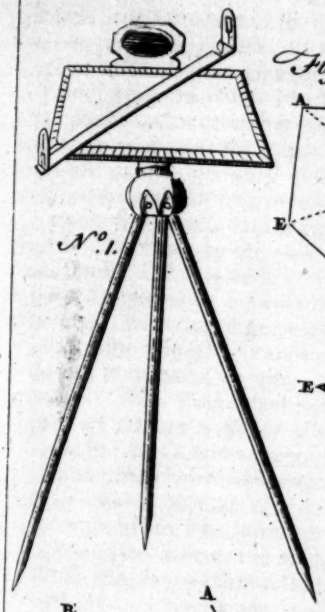
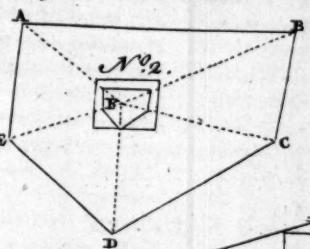
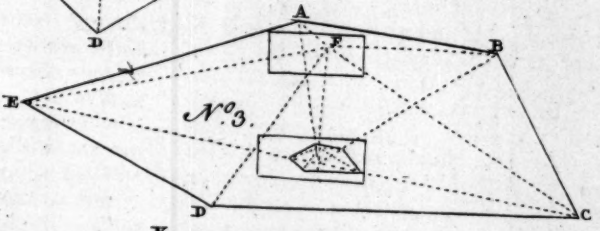
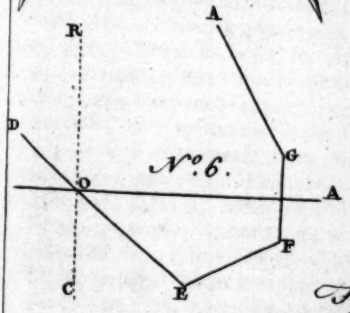


Fig. 1. PLAIN TABLE.







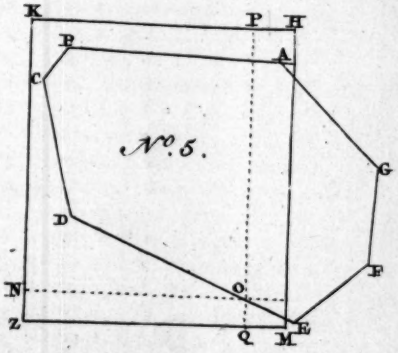
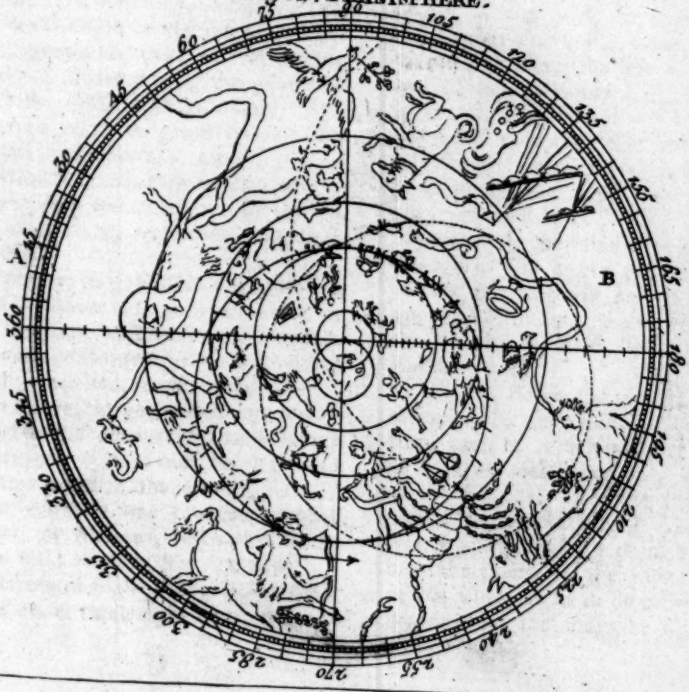


Fig. 2. PLANISPHERE.



J. Jefferys sculp.

BRITISH MUSEUM

dorific: or for want of that, ſome other warm aromatic, with the addition of about a fourth part of aqua theriacalis. Thoſe who are obliged to be near the ſick, muſt take care that the miaſmata do not approach the vital juices, nor yet the ſalival, to which purpoſe phyſicians recommend frequent ſpitting, and waſhing the mouth with vinegar or wine, or ſnuffing them up the noſe. The efficacy will be ſtill greater if they are imbued with rue, or citron-rind. It will be likewiſe proper to get a few ſpoonfuls of rheniſh wine, or bezoardic vinegar diluted with water or wine, and ſo take them. The Turks deal much in the juice of lemons. Externally many recommend the uſe of iſſues, becauſe the matter of the miaſma is wont to adhere to the ſerous part of the blood, and to be brought by the ſtrength of nature to the place where the iſſue is made. When the plague is actually begun, and the body is coſtive, a gentle clyſter ſhould be uſed. Then a ſweat ſhould be promoted twenty-four hours at leaſt, that the poiſon may exhale and paſs through the ſkin; and epithems to the heart will not be without benefit: they may be made of theriac, expreſſed oil of nutmegs, camphor, ſaffron, caſtor, and balſam of Peru. Langius recommends bleeding after ſweating: but above all acids are highly praiſed, ſuch as juice of citrons, Seville-oranges, lemons, vinegar, &c. When the ſtrength of the diſeaſe is vanquiſhed, gentle laxatives will be proper to expel the ſordes during the courſe of the diſeaſe. Mindererus aſſerts, that unleſs alexiterials be given twenty-four hours, all medicines are vain.

PLAGUE-WATER, *aqua epidemica*, one of the compound waters of the ſhops, diſtilled from mint, roſemary, angelica-roots, &c.

PLAIN, *planus*, in general, an appellation given to whatever is ſmooth and even, or ſimple, obvious, and eaſy to be underſtood; and, conſequently, ſtands oppoſed to rough, enriched, or laboured.

A plain figure, in geometry, is an uniform ſurface; from every point of whoſe perimeter, right lines may be drawn to every other point in the ſame.

A plain angle is one contained under two lines, or ſurfaces, in contradiſtinction to a ſolid angle. See ANGLE.

The doctrine of plain triangles, as thoſe included under three right lines, is termed plain trigonometry. See the article TRIGONOMETRY.

PLAIN CHART. See the article CHART.

PLAIN SAILING. See NAVIGATION.

PLAIN SCALE. See the article SCALE.

PLAIN TABLE, in ſurveying, a very ſimple inſtrument, whereby the draught of a field is taken on the ſpot, without any future protraction. It is generally of an oblong rectangular figure, and ſupported by a fulcrum, ſo as to turn every way by means of a ball and ſocket. It has a moveable frame, which ſerves to hold faſt a clean paper; and the ſides of this frame, facing the paper, are divided into equal parts every way. It has alſo a box with a magnetical needle, and a large index with two ſights: and, laſtly, on the edge of the frame, are marked degrees and minutes, to ſupply the place of a graphometer. See plate CCIII. fig. 1. n° 1.

1. To delineate or take the plot of a field A B C D E (*ibid.* n° 2.) by the help of a plain table, from one ſtation whence all its angles may be ſeen, and their diſtances meaſured by a chain. At any convenient place, F, let the plain table be erected; cover it with clean paper, in which let ſome point near the middle repreſent the ſtation: then applying, at this point, the index and ſights, ſo as to be moveable about it, direct it ſo as that ſome mark may be ſeen at one of the angles of the field, ſuppoſe A; from the ſtation-point F, draw a faint or dotted line along the ſide of the index; and having meaſured F A, the diſtance of the ſtation from the foreſaid angle, lay it off upon the faint line, by means of a ſcale of equal parts, and let a mark be made on the paper repreſenting the angle of the field A. Keeping the table immoveable, the ſame is to be done with the reſt of the angles; then right lines joining the angular points, ſo laid off upon the faint lines, ſhall include a figure exactly like the field, as is evident from Euclid's 5. 6.

2. To lay down the plot of a field by means of the plain table, at two ſtations, from each of which all the angles can be ſeen by meaſuring only the diſtance of the ſtations. Let the inſtrument be placed at the ſtation, F (*ibid.* n° 3.); then having choſen a point repreſenting it on the paper, let the index be applied at this point, ſo as to be moveable about it; next let the index be directed, ſucceſſively,

ceſſively, to the ſeveral angles of the field; and when any angle is ſeen through the ſights, draw an obſcure or dotted line along the ſide of the index: and let the index be directed, in this manner, to the ſtation G; and on the obſcure line drawn along its ſide pointing to A, ſet off from a ſcale of equal parts a line correſponding to the meaſured diſtance of the ſtations, and this will determine the point G. Then remove the inſtrument to the ſtation G; and applying the index to the line repreſenting the diſtance of the ſtations, place the inſtrument ſo that the firſt ſtation may be ſeen through the ſights; and the inſtrument remaining immoveable, let the index be applied at the point repreſenting the ſecond ſtation G, and be ſucceſſively directed by means of its ſights, to all the angles of the field, drawing (as before) obſcure lines along the ſide of the index; and the interſection of the two obſcure lines, drawn to the ſame angle from the two ſtations, will always repreſent that angle on the plan. Care being taken not to miſtake theſe lines for one another, lines joining thoſe interſections will form a figure on the paper like to the field.

3. To take the plot of a wood, park, or the like, by the plain-table, and meaſuring round the ſame. Suppoſe ABCDEFG (*ibid.* n° 4.) to be the figure you would delineate upon the plain-table. Having put a ſheet of paper upon the table, place your inſtrument at the angle A, and direct your ſights to the next angle at B, and by the ſide thereof draw a line upon your table, as the line AB. Then meaſure by the hedge-ſide from the angle A to the angle B, which ſuppoſe twelve chains five links. Then from your ſcale take twelve chains five links, and lay off upon your table from A to B. Then turn the index about, and direct the ſights to G, and draw the line AG upon the table: but at preſent, you need not meaſure the diſtance.

Remove your inſtrument from A, and ſet up a mark where it laſt ſtood, and place your inſtrument at the ſecond angle B. Then laying the index upon the line AB, turn the whole inſtrument about, till through the ſights you ſee the mark ſet up at A, and there ſcrew the inſtrument. Then laying the index upon the point B, direct your ſights to the angle C, and draw the line BC upon your table. Then meaſuring the diſtance BC four chains forty-five links, take that diſtance from your ſcale, and ſet it upon your table from B to C.

Remove your inſtrument from B, and ſet up a mark in the room of it, and place your inſtrument at C, laying the index upon the line CB; and turn the whole inſtrument about, till through the ſights you eſpy the mark ſet up at B, and there faſten the inſtrument. Then laying the index on the point C, direct the ſights to D, and draw upon the table the line CD. Then meaſure from C to D eight chains eighty-five links, and ſet that diſtance upon your table from C to D.

Remove the inſtrument to D, placing a mark at C where it laſt ſtood, and lay the index upon the line DC, turning the whole inſtrument about, till through the ſights you ſee the mark at C, and there faſten the inſtrument. Then lay the index on the point D, and direct the ſights to E, and draw the line DE. Then with your chain meaſure the diſtance DE thirteen chains four links, which lay off on the table from D to E.

Remove your inſtrument to E, placing a mark at D where it laſt ſtood, and, laying the index upon the line DE, turn the whole inſtrument about, till through the ſights you ſee the mark at D, and there faſten the inſtrument. Then lay the index on the point E, and direct the ſights to F, and draw the line EF. Then meaſure the diſtance EF ſeven chains ſeventy links, which take from your ſcale, and lay off from E to F.

Remove your inſtrument to F, placing a mark at E where it laſt ſtood, and lay the index upon the line EF, turning the inſtrument about, till you ſee the mark ſet up at E, and there faſten the inſtrument. Then laying the index on the point F, direct the ſights to G, and draw the line FG upon the table, which line FG will cut the line AG in the point G. Then meaſure the diſtance FG five chains ſixty-ſeven links, and lay it off from F to G. Remove your inſtrument to G, ſetting a mark where it laſt ſtood, and lay the index upon the line FG, turning the whole inſtrument about, till through the ſights you ſee the mark at F, and there faſten the inſtrument. Then laying the index upon the point G, direct your ſights to A (your firſt mark) and draw the line GA, which if you have truly wrought, will paſs directly through the point A, where you firſt began.

In this manner may you take the plot of any

any champaign plain, be it never ſo large. And here note, that very often hedges are of ſuch thickneſs, that you cannot come near the ſides or angles of the field, either to place your inſtrument, or meaſure the lines. Therefore, in ſuch caſes you muſt place your inſtrument, or meaſure your lines parallel to the ſide thereof; and then your work will be the ſame as if you meaſured the hedge itſelf. Note alſo, That in thus going about the field, you may much help yourſelf by the needle. For looking what degree of the card the needle cuts at one ſtation, if you remove your inſtrument to the next ſtation, and with your ſights look to the mark where the inſtrument laſt ſtood, you will find the needle to cut the ſame degree again, which will give you no ſmall ſatisfaction in the proſecution of your work. And, though there be a hundred or more ſides, the needle will ſtill cut the ſame degrees at all of them, except you have committed ſome former error: therefore, at every ſtation have an eye to the needle.

4. Of ſhifting the paper. In taking the plot of a field by the plain-table, and going about the ſame, as before directed, it may ſo fall out, if the field be very large, and when you are to take many incloſures together, that the ſheet of paper upon the table will not hold all the work. But you muſt be forced to take off that ſheet, and put another clean ſheet in the room thereof: and, in plotting of a manor or lordſhip, many ſheets may be thus changed, which we call ſhifting of paper. The manner of performing thereof is as follows:

Suppoſe in going about to take the plot ABCDEFG (*ibid.* n° 5.) as before directed, that you having made choice of the angle at A for the place of the beginning, and proceed from thence to B, and from B to C, and from C to D, when you come to the angle at D, and are to draw DE, you want room to draw the ſame upon the table; do thus:

Firſt, through the point D draw the line DO, which is almoſt ſo much of the line DE as the table will contain. Then near the edge of the table HM, draw a line parallel to HM, by means of the inches and ſubdiviſions on the oppoſite ſides of the frame, as PQ, and another line at right angles to that through the point O, as ON. This being done, mark this ſheet of paper, with the figure (1) about the middle thereof, for the firſt ſheet. Then taking this ſheet off your table, put another clean ſheet thereon, and draw upon it a line parallel to the contrary edge of the table, as the line RS (*ibid.* n° 6.). Then taking your firſt ſheet of paper, lay it upon the table ſo, that the line PQ may exactly lie upon the line RS, to the beſt advantage, as at the point O. Then with the point of your compaſſes draw ſo much of the line OD upon the clean ſheet of paper as the table will hold. Having thus done, proceed with your work upon the new ſheet, beginning at the point O; and ſo going forward with your work, in all reſpects as has been before directed; as from O to E, from E to F, from F to G, and from G to A; ſhifting your paper as you have occaſion.

PLAIN NUMBER, is a number that may be produced by the multiplication of two numbers into one another: thus 20 is a plain number produced by the multiplication of 5 into 4.

PLAIN PLACE, *locus planus*, or *locus ad planum*, among the antient geometricians, denoted a geometrical locus, when it was a right line or a circle, in oppoſition to a ſolid place, which was an ellipſis, parabola, or hyperbola. Theſe the moderns diſtinguiſhed into loci ad rectam, and loci ad circulum. See LOCUS.

PLAIN PROBLEM, in mathematics, is ſuch a problem as cannot be ſolved geometrically, but by the interſection either of a right line and a circle, or of the circumferences of two circles; as, given the greateſt ſide, and the ſum of the other two ſides of a right-angled triangle, to find the triangle, as alſo to deſcribe a trapezium that ſhall make a given area of four given lines. Such problems can only have two ſolutions, in regard a right line can only cut a circle, or one circle cut another in two points.

PLAIN, in heraldry, ſometimes denotes the point of the ſhield, when couped ſquare; a part remaining under the ſquare, of a different colour or metal from the ſhield. This has been ſometimes uſed as a mark of baſtardy, and called champaigne; for, when the legitimate deſcendants of baſtards have taken away the bar, fillet, or traverſe borne by their fathers, they are to cut the point of the ſhield with a different colour called plain.

PLAINT, in law, the exhibiting any action, real or perſonal, in writing. See the article ACTION.

PLAISE, the engliſh name of a ſpecies of the

the pleuronectes, with ſmooth ſides, a ſpine near the anus, and the eyes and ſix tubercles placed on the right ſide of the head: it is ſomewhat larger than the flounder. See PLEURONECTES.

PLAISTER, or PLASTER. See the article PLASTER.

PLAN, in general, denotes the repreſentation of ſomething drawn on a plane: ſuch are maps, charts, ichnographies, &c. See the articles MAP, CHART, &c.

The term plan, however, is particularly uſed for a draught of a building, ſuch as it appears, or is intended to appear, on the ground; ſhewing the extent, diviſion, and diſtribution of its area, or ground-plot, into apartments, rooms, paſſages, &c. See BUILDING.

A geometrical plan is that, wherein the ſolid and vacant parts are repreſented in their natural proportions.

The raiſed plan of a building, is the ſame with what is otherwiſe called an elevation, or orthography. See the article ORTHOGRAPHY.

A perſpective plan, is that exhibited by degradations, or diminutions, according to the rules of perſpective. See the article PERSPECTIVE.

To render plans intelligible, it is uſual to diſtinguiſh the maſſives, with a black waſh; the projectures on the ground, are drawn in full lines, and thoſe ſuppoſed over them in dotted lines. The augmentations, or alterations, to be made, are diſtinguiſhed by a colour different from what is already built; and the tints of each plan made lighter, as the ſtories are raiſed.

In large buildings, it is uſual to have three ſeveral plans, for the three firſt ſtories.

PLANCHIER, or PLANCERE, in architecture, the under part of the corona, or drip, making the ſuperior part of the corniche, between two cymatiums. See CORNICHE and CYMATIUM.

PLANE, *planum*, in geometry, denotes a plain ſurface, or one that lies evenly between its bounding lines: and as a right line is the ſhorteſt extenſion from one point to another, ſo a plain ſurface is the ſhorteſt extenſion from one line to another.

In aſtronomy, conics, &c. the term plane, is frequently uſed for an imaginary ſurface, ſuppoſed to cut and paſs through ſolid bodies; and on this foundation, is the whole doctrine of conic ſections built. See CONIC SECTIONS.

For the inclination of the planes of the orbits of the planets, ſee the articles ORBIT, INCLINATION and PLANET.

In mechanics, planes are either horizontal, that is, parallel to the horizon, or inclined thereto. See the articles HORIZON, and INCLINED PLANE.

The determining how far any given plane, deviates from an horizontal one, makes the whole buſineſs of levelling. See the article LEVELLING.

In optics, the planes of reflection and refraction, are thoſe drawn through the incident and reflected or refracted rays. See the articles INCIDENCE, REFLECTION, and REFRACTION.

The plane of the horopter, is that drawn through the horopter, perpendicularly to the plane of the two optical axes. See the article HOROPTER.

In perſpective, we meet with the perſpective plane, which is ſuppoſed to be pellucid, and perpendicular to the horizon; the horizontal plane, ſuppoſed to paſs through the ſpectator's eye, parallel to the horizon; the geometrical plane, likewiſe parallel to the horizon, whereon the object to be repreſented is ſuppoſed to be placed, &c. See PERSPECTIVE.

The plane of projection, in the ſtereographic projection of the ſphere, is that on which the projection is made; correſponding to the perſpective plane. See the articles MAP and PROJECTION.

For the inclination and declination of planes, ſee the articles INCLINATION and DECLINATION.

PLANE, in joinery, an edged tool, or inſtrument for parting and ſhaving of wood ſmooth. See plate of JOINERY.

It conſiſts of a piece of wood, very ſmooth at bottom, as a ſtock or ſhaft; in the middle of which is an aperture, through which a ſteel-edge, or chiſſel, placed obliquely, paſſes, which being very ſharp, takes off the inequalities of the wood it is ſlid along.

Planes have various names, according to their various forms, ſizes, and uſes: as, 1. The fore-plane, which is a very long one, and is uſually that which is firſt uſed: the edge of its iron or chiſſel is not ground ſtraight, but riſes with a convex arch in the middle; its uſe is to take off the greater irregularities of the ſtuff, and to prepare it for the ſmoothing plane. 2. The ſmoothing-plane is ſhort and ſmall, its chiſſel being finer: its uſe is to take off the greater irregularities left by the fore-plane, and to prepare the wood for the jointer. 3. The jointer

the longeſt of all; its edge is very fine, and does not ſtand out above an hair's breadth: it is chiefly uſed for ſhooting the edge of a board perfectly ſtraight, for jointing tables, &c. 4. The ſtrike-block, which is like the jointer, but ſhorter: its uſe is to ſhoot ſhort joints. 5. The rabbit-plane, which is uſed in cutting the upper edge of a board, ſtraight or ſquare, down into the ſtuff, ſo that the edge of another cut after the ſame manner, may join in with it, on the ſquare; it is alſo uſed in ſtriking facias on mouldings: the iron or chiſſel of this plane is as broad as its ſtock, that the angle may cut ſtraight, and it delivers its ſhavings at the ſides, and not at the top, like the others. 6. The plough, which is a narrow rabbit-plane, with the addition of two ſtaves, on which are ſhoulders: its uſe is to plow a narrow ſquare groove on the edge of a board. 7. Moulding-plane, which are of various kinds, accommodated to the various forms and profiles of the moulding; as the round-plane, the hollow-plane, the ogee, the ſnipe's bill, &c. which are all of ſeveral ſizes from half an inch, to an inch and a half.

PLANE-TREE, *platanus*, in botany, a genus of the monoecia-polyandria claſs of plants, the male corolla whereof is ſcarce viſible: the female one conſiſts of ſeveral concave, oblong, and clavated petals: there is no pericarpium, ſeveral of the fruits conſtituting a round, rough ball; the ſeed, which ſtands upon a ſetaceous ſtyle, is roundiſh, and is terminated by a ſubulated ſtyle, and there is a capillary down adhering to its baſe.

This tree grows to a very conſiderable ſize, and is ramoſe and ſpreading; the bark is ſmooth; the wood firm, and pale-coloured; and the leaves are very large, of a palmated figure, and divided into ſix or ſeven parts at the edge.

PLANET, *planeta*, πλανήτης, a celeſtial body, revolving round the ſun as a center, and continually changing its poſition, with reſpect to the fixed ſtars; whence the name planet, which is a greek word, ſignifying wanderer.

The planets are uſually diſtinguiſhed into primary, and ſecondary. The primary ones, called, by way of eminence, planets, are thoſe which revolve round the ſun as a center; and the ſecondary planets, more uſually called ſatellites, or moons, are thoſe which revolve round a primary planet as a center, and conſtantly attend it in its revolution round the ſun. See SATELLITE, and MOON.

The primary planets are again diſtinguiſhed into ſuperior and inferior. The ſuperior planets, are thoſe further from the ſun than our earth; as mars, jupiter, and ſaturn: and the inferior planets, are thoſe nearer the ſun than our earth, as venus and mercury; for the aſtronomy, and other peculiarities, of which, ſee MARS, JUPITER, &c.

Nature of the PLANETS. That the planets are opake bodies, like our earth, appears evident for the following reaſons. 1. Since in venus, mercury, and mars, only that part of the diſk illuminated by the ſun, is found to ſhine; and, again, venus and mercury, when between the earth and the ſun, appear like dark ſpots or maculæ, on the ſun's diſk; it is evident, that mars, venus, and mercury are opake bodies, illuminated with the borrowed light of the ſun. And the ſame appears of jupiter, from its being void of light in that part to which the ſhadow of the ſatellites reaches, as well as in that part turned from the ſun; and that his ſatellites are opake, and reflect the ſun's light, is abundantly ſhewn. Wherefore, ſince ſaturn, with his ring and ſatellites, only yield a faint light, fainter conſiderably than that of the fixed ſtars, though theſe be vaſtly more remote; and than that of the reſt of the planets: it is paſt doubt, he too, with his attendants, are opake bodies. 2. Since the ſun's light is not tranſmitted through mercury and venus, when placed againſt him, it is plain they are denſe opake bodies; which is likewiſe evident of jupiter, from his hiding the ſatellites in his ſhadow; and therefore, by analogy, the ſame may be concluded of ſaturn. 3. From the variable ſpots in venus, mars, and jupiter, it is evident theſe planets have a changeable atmoſphere; which changeable atmoſphere may, by a like argument, be inferred of the ſatellites of jupiter, and therefore by ſimilitude the ſame may be concluded of the other planets. 4. In like manner, from the mountains obſerved in venus, the ſame may be ſuppoſed in the other planets. 5. Since then, ſaturn, jupiter, both their ſatellites, mars, venus, and mercury, are opake bodies, ſhining with the ſun's borrowed light, are furniſhed with mountains, and encompaſſed with a changeable atmoſphere; they have, of

conſe-

conſequence, waters, ſeas, &c. as well as dry land, and are bodies like the moon, and therefore like the earth. Q. E. D.

And hence, it ſeems highly probable, that the other planets have their animal inhabitants, as well as our earth.

Motion of the PLANETS. Each of the primary planets bend their courſe about the center of the ſun, and are accelerated in their motions as they approach to him, and retarded as they recede from him; ſo that a ray, drawn from any one of them to the ſun, always deſcribes equal ſpaces, or areas, in equal times: whence it follows, that the power which bends their way into a curve line, muſt be directed to the ſun. This power is no other than that of gravitation, which we have already proved to increaſe, as the ſquare of the planet's diſtance from the ſun decreaſes. See the articles GRAVITATION, ORBIT, &c.

But the univerſality of this law ſtill farther appears, by comparing the motions of the different planets: for the power which acts on a planet near the ſun, is manifeſtly greater than that which acts on a planet more remote; both becauſe it moves with greater velocity, and becauſe it moves in a leſſer orbit, which has more curvature, and ſeparates farther from its tangent, in arcs of the ſame length, than in a greater orbit. By comparing the motion of the planets, the velocity of a nearer planet is found to be greater than that of one more remote, in the proportion of the ſquare-root of the number which expreſſes the greater diſtance, to the ſquare-root of that which expreſſes the leſſer diſtance; ſo that if one planet was four times farther from the ſun than another, the velocity of the firſt would be half the velocity of the latter; and the nearer planet would deſcribe an arc in one minute, equal to the arc deſcribed by the other planet in two minutes: and tho' the curvature of the orbits was the ſame, the nearer planet would deſcribe, by its gravity, four times as much ſpace, as the other would deſcribe in the ſame time; ſo that the gravity of the nearer planet would appear to be quadruple, from the conſideration of its greater velocity only. But beſides this, as the radius of the leſſer orbit is ſuppoſed to be four times leſs than the radius of the other, the leſſer orbit muſt be four times more curve; and the extremity of a ſmall arc, of the ſame length, will be four times farther below the tangent, drawn at the other extremity, in the leſſer orbit than in the greater; ſo that, though the velocities were equal, the gravity of the nearer planet would, on this account only, be found to be quadruple. Hence, on both theſe accounts together, the greater velocity of the nearer planet, and the greater curvature of its orbit, its gravity towards the ſun muſt be ſuppoſed ſixteen times greater, though its diſtance from the ſun is only four times leſs than that of the other; that is, when the diſtances are as 1 to 4, the gravities are reciprocally as the ſquares of theſe numbers, or as 16 to 1.

And in the ſame manner as this principle governs the motions of the primary planets of the great ſolar ſyſtem, acts at their ſurfaces, and keeps their parts together; ſo it governs alſo the motions of the ſatellites, or ſecondary planets, in the leſſer ſyſtems of which the greater is compoſed, and is extended around them, decreaſing in the ſame manner as the ſquares of the diſtances increaſe. Nay the comets ſeem evidently to be governed by the ſame law, ſince they deſcend with an accelerated motion, as they approach towards the ſun, and aſcend again with a retarded motion, bending their way about the ſun, and deſcribing equal areas in equal times, by rays drawn from them to his center.

For the various ſyſtems that have been formed concerning the planets, ſee the articles COPERNICAN, PTOLEMAIC, TYCHONIC, &c.

And as to their diſtances, diameters, orbits, inclination of their orbits, &c. they will be found under the articles DISTANCE, DIAMETER, ORBIT, INCLINATION, &c.

PLANETARIUM, an aſtronomical machine, ſo called from its repreſenting the motions, orbits, &c. of the planets, agreeably to the copernican ſyſtem. See the article COPERNICAN.

The planetarium is more generally known by the name orrery, and therefore we have given its deſcription and uſe under that article. See ORRERY.

PLANETARY, ſomething relating to the planets. See the article PLANET.

Thus we meet with planetary days, hours, years, ſyſtems, &c. See the articles DAY, HOUR, &c.

PLANIMETRY, that part of geometry which

which conſiders lines and plain figures, without conſidering their height or depth. See the articles TRIANGLE, SQUARE, SURVEYING, &c.

PLANISPHERE, ſignifies a projection of the ſphere, and its various circles on a plane; in which ſenſe maps, wherein are exhibited the meridians, and other circles of the ſphere, are planiſpheres. See the articles MAP, PROJECTION, CIRCLE, SPHERE, &c.

PLANISPHERE, is more particularly uſed for an aſtronomical inſtrument uſed in obſerving the motions of the heavenly bodies.

It conſiſts of a projection of the celeſtial ſphere upon a plane, repreſenting the ſtars, conſtellations, &c. in their proper order; ſome being projected on the meridian, and others on the equator.

Among all theſe planiſpheres, that of M. Caſſini ſeems to deſerve the preference: it is compoſed of two circular, but unequal plates, A and B (plate CCIII. fig. 2.) whereof the leaſt, B, is ſo fitted within the other, as to turn round upon the center, whilſt the larger circle, A, remains immoveable. On the leſſer plate are delineated the conſtellations of the northern hemiſphere, with its ſeveral circles. The limb of the inferior plate, A, is divided into three hundred and ſixty degrees, and into twenty-four hours, which are reckoned from twelve to twelve, and each hour into ſixty minutes. Between the two oppoſite hours, twelve and twelve, is extended a ſilver-thread, which paſſing over the center, or northern pole, repreſents the meridian. If then the ſouth point be turned towards the obſerver, the ſemi-circle towards the left hand will be the eaſt, and that on the right the weſt; and the hours on the former will be thoſe of the forenoon, and the hours on the latter thoſe of the afternoon.

Uſe of the PLANISPHERE. 1. To repreſent the face of the heavens for any day and hour: find, on the leſſer moveable plate, the month and day propoſed, and turn the plate till the given day of the month ſtand againſt the hour and minute required; and the plate will then repreſent the face of the heavens, by ſhewing what ſtars are then riſing in the meridian, or what ſetting. 2. To know at what hour and minute any ſtar riſes or ſets, &c. Turn the moveable plate, till the given ſtar reaches the horizon, eaſt or weſt, and againſt the given day, on the moveable plate, is the hour and minute on the exterior or immoveable one: and in the ſame manner may moſt of the problems, uſually reſolved by the celeſtial globe, be determined.

Nautical PLANISPHERE. See the article NAUTICAL.

PLANO-CONCAVE, and PLANO-CONVEX-LENSES. See the article LENS.

PLANT, *planta*, is defined to be an organical body, deſtitute of ſenſe and ſpontaneous motion, adhering to another body in ſuch a manner as to draw from it its nouriſhment, and having power of propagating itſelf by ſeeds.

As to the parts of which a plant conſiſts, they are the root, ſtalk, leaf, flower, and fruit. See ROOT, STALK, &c.

Plant and vegetable are pretty near terms ſynonymous, every plant being a vegetable. Now Dr. Boerhaave defines a vegetable to be a body generated of the earth, or ſomething ariſing out of the earth, to which it adheres, or is connected, by parts called roots, through which it receives the matter of its nouriſhment and increaſe; and conſiſts of juices and veſſels ſenſibly diſtinct from each other: or, a vegetable is an organical body, compoſed of veſſels and juices every where diſtinguiſhable from each other; to which body grow roots or parts, whereto it adheres, and from which it derives the matter of its life and growth.

This definition furniſhes a juſt and adequate idea of a vegetable; for by its conſiſting of diſtinct veſſels and juices, it is diſtinguiſhed from a foſſil; and by its adhering to another body, from which it derives its nouriſhment, and being deſtitute of ſenſation, it is ſufficiently diſtinguiſhed from an animal. See the articles FOSSIL and ANIMAL.

The veſſels, or containing parts of plants, conſiſt chiefly of earth, bound or connected together by oil, as a gluten; which being exhauſted by fire, air, age, or the like, the plant moulders, or returns again into its earth or duſt: but it muſt be owned, that water, air, ſalt, and ſulphur or oil, are likewiſe conſtituent parts of plants, ſince they can be all obtained by a well managed analyſis. See AIR, WATER, SALT, &c.

The root, or part whereby plants are connected to their matrix, and by which they receive their nutritious juice, conſiſts of an infinite number of abſorbent veſſels, which being diſperſed through the interſtices of the earth, attract or imbibe the

juices of the ſame; conſequently, every thing in the earth that is diſſoluble in water, is liable to be imbibed, as air, ſalt, oil, and fumes of minerals, metals, &c. and of theſe plants do really conſiſt.

The motion of theſe nutritious juices is not unlike that of the blood in animals, being effected by the action of the air. The diſcovery of this we owe to the admirable Malpighi, who firſt obſerved, that plants conſiſt of two ſeries or orders of veſſels: 1. Such as receive and diſtribute the alimentary juices, anſwering to the arteries, lacteals, veins, &c. of animals. 2. The tracheæ, or air-veſſels, which are long hollow pipes, wherein air is commonly received and expelled; that is, inſpired and expired. Hence it follows, that the heat of the ſun muſt have a ſtrong effect on the air included in theſe tracheæ; whence ariſes a perpetual ſpring of action, to promote the circulation of the juices in plants.

For the botanical diſtribution of plants into claſſes, genera, &c. ſee the articles BOTANY, GENUS, &c.

And as to the elements, or conſtituent parts of plants, they will be found under the articles ELEMENT, OIL, SALT, &c.

Paraſitical PLANTS. See PARASITES.

Senſitive PLANT. See SENSITIVE.

Foſſil PLANTS, thoſe found buried in the earth, and lodged in almoſt all the kinds of ſtrata, or ſubſtances, to be met with there. See plate CCIV.

The moſt frequent foſſil plants are the polypody, ſpleenwort, oſmund, trichomanes, and the ſeveral larger and ſmaller ferns; but beſide theſe there are alſo found pieces of the equiſetums, or horſetails, and joints of the ſtellated plants, as the clivers, madder, and the like: and theſe have been too often miſtaken for flowers. Sometimes there are alſo found complete graſſes, or parts of them; as alſo reeds and other water-plants; ſometimes the ears of corn, and not unfrequently the twigs or bark, and impreſſions of the bark, and fruit of the pine or fir-kind, which have been, from their ſcaly appearance, miſtaken for the ſkins of fiſhes; and ſometimes, but that very rarely, we meet with moſſes and ſea-plants.

Many of the ferns, not unfrequently found, are of very ſingular kinds, and ſome ſpecies yet unknown to us; and the leaves of ſome appear ſet at regular diſtances, with round protuberances and cavities. The ſtones which contain theſe plants ſplit readily, and are often found to contain, on one ſide, the impreſſion of the plants; and on the other the prominent plant itſelf: and beſide all that have been mentioned, there have been frequently ſuppoſed to be found with us ears of common wheat, and of the maiz or indian corn; the firſt being in reality no other than the common endmoſt branches of the firs, and the other the thicker boughs of various ſpecies of that and of the pine-kind, with their leaves fallen off; ſuch branches, in ſuch a ſtate, cannot but afford many irregular tubercles and papillæ, and in ſome ſpecies, ſuch as are more regularly diſpoſed.

Theſe are the kinds moſt obvious in England; and theſe are either immerſed in the ſlaty ſtone which conſtitutes the whole ſtrata, or in flatted nodules, uſually of about three inches broad, which readily ſplit into two pieces on being ſtruck.

Though theſe ſeem the only ſpecies of plants found with us, yet in Germany there are many others, and thoſe found in different ſubſtances. A whitiſh ſtone, a little harder than chalk, frequently contains them: they are found alſo often in a grey ſlaty ſtone, of a firmer texture; not unfrequently in a blackiſh one; and, at times, in many others. Nor are the bodies themſelves leſs various here than the matter in which they are contained: the leaves of trees are found in great abundance, among which thoſe of the willow, poplar, whitethorn, and pear-trees, are the moſt common; ſmall branches of box, leaves of the olive tree, and ſtalks of garden-thyme, are alſo found there; and ſometimes ears of the various ſpecies of corn, and the larger as well as the ſmaller moſſes in great abundance.

Theſe ſeem the tender vegetables, or herbaceous plants, certainly found thus immerſed in hard ſtone, and buried at great depths in the earth; others of many kinds there are alſo named by authors, but as in bodies ſo imperfect, errors are eaſily fallen into, theſe ſeem all that can be aſcertained beyond mere conjecture.

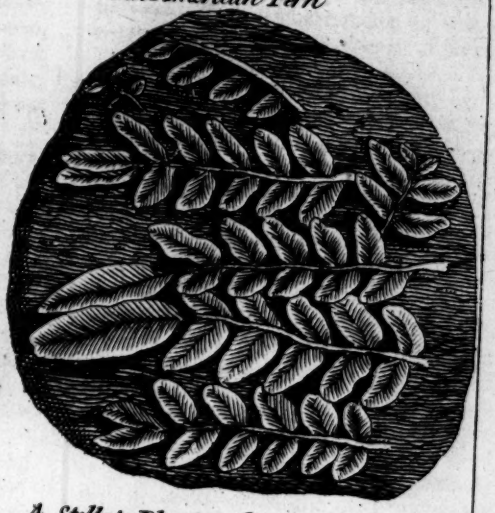
PLANTA, in anatomy, the ſole of the foot. See the article FOOT.

PLANTAGO, the PLANTAIN TREE, in botany. See the next article.

PLANTAIN, *plantago*, in botany, a plant

An Equisetum

An American Fern



A Stellate Plant and Fern

An Ear of Corn

Leaves encrusted with Spar

Moss

T. Jefferys sculp

BRITISH MUSEUM

plant of the tetrandria monogynia claſs, the flower whereof conſiſts of one petal, uſually wide expanded at the mouth, and with the limb divided into four oval ſegments: the fruit is a bilocular capſule, of an ovated figure, containing a great many oblong ſeeds.

The root, leaves, and ſeeds of plantain, are uſed in medicine, and reckoned cooling and aſtringent; being much recommended in fluxes of all kinds, particularly hæmorrhages, whether from the noſe, mouth, or uterus. It is likewiſe accounted a great healer of freſh wounds.

Ribwort, and bucks-horn plantain, are two ſpecies of, and agree with, plantain in virtues.

Water-PLANTAIN, *ranunculus*. See the article RANUNCULUS.

PLANTARIS, in anatomy, one of the extenſor-muſcles of the foot, which has its origin from the interior part of the external condyle.

PLANTATION, in the Weſt-Indies, denotes a ſpot of ground which a planter or perſon, arrived in a new colony, pitches on to cultivate for his own uſe, or is aſſigned for that purpoſe. However, the term plantation is often uſed in a ſynonymous ſenſe with colony. See the article COLONY.

The britiſh plantations in America, are, beſides the iſlands of Jamaica, Barbadoes, *&c.* thoſe of Virginia, Maryland, New-England, New-York, Carolina, Georgia, Penſylvania, New-Scotland, *&c.* See VIRGINIA, *&c.*

By ſtat. 12 Car. II. and 11 and 12 Will. III. all governors of the plantations are, at their entrance, to take an oath, that, to their utmoſt, they ſhall ſee the acts of parliament made concerning the ſaid colonies put in execution; and on failure, complaint being made to the king, ſuch a governor is to be removed, and forfeit the ſum of one thouſand pounds. If any governor, deputy-governor, *&c.* oppreſs any of the king's ſubjects under their government, or act any ways contrary to the laws of this realm, or in force within their governments, *&c.* it ſhall be determined in the court of king's bench in England, and the ſame puniſhment inflicted as uſual for ſuch offences in England.

And by 7 and 8 Will. III. all laws, cuſtoms, *&c.* practiſed in any of the plantations that are repugnant to any laws already made, or to any law hereafter to be made, relating to thoſe plantations, are declared null and void. And all places of truſt in the courts of law, or relating to the treaſury, in any iſland or colony, ſhall be held by native-born ſubjects of Great-Britain, Ireland, or of the ſaid colonies. Alſo all perſons, claiming any right in any of them, ſhall not diſpoſe of the ſame to any but natural born ſubjects; and all governors appointed by ſuch proprietors, ſhall be approved by his majeſty, and take the oaths accordingly.

By 5 Geo. II. c. 7. all real eſtates in the plantations ſhall be chargeable with all juſt debts whatſoever, and ſubject to the like remedies and proceedings as in England. And for the more eaſy recovery of debts in the colonies, in which any perſon reſiding in Great-Britain ſhall be party, ſuch debt may be proved. Here an oath before any chief magiſtrate near where the perſon ſhall reſide; and being certified under the common ſeal of the city or town, ſhall be of the ſame force as if the perſon had appeared in open court, or upon commiſſion.

By 6 Geo. II. c. 13. all ſugars and paneles of the product of any plantation not under his majeſty's dominion, imported into any of his majeſty's plantations, ſhall pay five ſhillings for every hundred weight; and for all rum, or ſpirits of foreign produce, nine pence per gallon; and for molaſſes, ſix pence per gallon. And, on importation, an entry ſhall be made by the proper officers, *&c.* and the duties paid down in ready money before landing the goods, on pain of forfeiture. And by the ſame act, ſugars, rum, *&c.* not the produce of britiſh plantations, are prohibited to be imported into Ireland.

By 5 Geo. II. c. 22. no hats or felts ſhall be exported from one britiſh plantation to another, on penalty of five hundred pounds and forfeiture of the goods; and perſons aiding and aſſiſting therein, ſhall forfeit forty pounds. This ſtatute alſo regulates the trade of felt-making, *&c.* and no perſon ſhall retain in the ſaid art any negro, on forfeiture of five pounds for every month.

For other regulations concerning the britiſh plantations and the trade to and from them, ſee NAVAL AFFAIRS.

By a proclamation of queen Anne's, the currency of the foreign coins, in the plantations, was ſettled as follows: Seville pieces of eight, old plate, ſeventeen penny-weight twelve grains, at

four ſhillings and ſixpence; Seville pieces of eight, new plate, fourteen penny weight, at three ſhillings and ſeven pence farthing; Mexico pieces of eight, ſeventeen penny-weight twelve grains, at four ſhillings and ſix pence, pillar pieces of eight, ſeventeen penny-weight, twelve grains, at four ſhillings and ſix pence three farthings; Peru pieces of eight, old plate, ſeventeen penny-weight twelve grains, at four ſhillings and five pence; croſs-dollars, eighteen penny-weight, at four ſhillings and four pence three farthings; ducatoons of Flanders, twenty penny-weight and twenty-one grains at five ſhillings and ſix pence; ecus, or crowns of France, ſeventeen penny-weight twelve grains, at four ſhillings and ſix pence; cruſadoes of Portugal, eleven penny-weight four grains, at two ſhillings and ten pence farthing; three guilder pieces of Holland, twenty penny-weight and ſeven grains, at five ſhillings and two pence farthing; old rix-dollars of the empire, eighteen penny-weight and ten grains, at four ſhillings and ſix pence; and the halves, quarters, and other parts in proportion to their denominations, and light pieces in proportion to their weight.

Strength of the britiſh PLANTATIONS. The encroachments of the French upon the britiſh plantations, the number of whoſe inhabitants is more than three times that of French both in Canada and Louiſiana put together, is certainly a very great indignity offered to his majeſty and the nation; eſpecially ſince the Engliſh planted and improved them, from the ſea-coaſts almoſt up to the ſources of the largeſt rivers, by the conſent of the natives, whoſe lands they have actually purchaſed and paid for; and whoſe traffic we may be entirely deprived of, if the French do not meet with an effectual check; which, could proper meaſures be taken to make the ſeveral colonies of New England, New York, New Jerſey, Penſilvania, Maryland, Virginia, and North and South Carolina act in concert, may very eaſily be done: but the miſchief is, all theſe colonies are independent on each other, and have different views and intereſts; which makes it next to impoſſible to draw any conſiderable body of forces together on an emergency, though the ſafety and preſervation, not only of any particular colony, but of all the britiſh plantations on the american continent, were ever ſo nearly concerned. To remedy this inconvenience, ſome have, with the utmoſt deference to his majeſty and his miniſters, propoſed, that all the colonies appertaining to the crown of Great Britain on the northern continent of America, be united under a legal, regular, and firm eſtabliſhment; and that a lieutenant-general be appointed, to whom the governors of each province ſhall be ſubordinate: alſo that an aſſembly compoſed of a certain number of deputies from each province, ſhall have power to ſettle and appoint what quotas or proportions of men, money, *&c.* each province is to raiſe for their mutual defence; and if neceſſary, for offence and invaſion of their enemies; in all which caſes, the lieutenant or governor general is to have a negative, but not to enact any thing without the concurrence of the majority of them. Such a coalition, tempered with, and founded on prudence, moderation and juſtice, could not fail to lay a laſting and ſure foundation of ſuch ſtrength and proſperity, as would enable the plantations to defend themſelves againſt their enterprizing and ambitious neighbours.

PLANTING, in agriculture and gardening, is ſetting a tree or plant taken from its proper place, in a new hole or pit; throwing freſh earth over its root, and filling up the hole to the level of the ſurface of the ground.

The firſt thing in planting is to prepare the ground before the trees or plants are taken out of the earth, that they may remain out of the ground, as ſhort a time as poſſible, and the next is to take up the trees or plants in order to their being tranſplanted. In taking up the trees, carefully dig away the earth round the roots, ſo as to come at their ſeveral parts to cut them off; for if they are torn out of the ground without care, the roots will be broken and bruiſed to the great injury of the trees. When you have taken them up, the next thing is to prepare them for planting by pruning the roots and heads. And firſt, as to the roots; all the ſmall fibres are to be cut off, as near to the place from whence they are produced, as may be, except they are to be replanted immediately after they are taken up. Then prune off all the bruiſed or broken roots, all ſuch as are irregular, and croſs each other, and all downright roots, eſpecially in fruit-trees: ſhorten the larger roots in proportion to the age, the ſtrength, and nature

nature of the trees; obſerving that the walnut, mulberry, and ſome other tender-rooted kinds ſhould not be prunned ſo cloſe as the more hardy ſorts of fruit and foreſt-trees: in young fruit trees, ſuch as pears, apples, plumbs, peaches, &c. that are one year old from the time of their budding or grafting, the roots may be left only about eight or nine inches long; but in older trees, they muſt be left of a much greater length: but this is only to be underſtood of the larger roots; for the ſmall ones muſt be chiefly cut quite out, or pruned very ſhort. The next thing is the pruning of their heads, which muſt be differently performed in different trees; and the deſign of the trees muſt alſo be conſidered: thus, if they are deſigned for walls or eſpaliers, it is beſt to plant them with the greateſt part of their heads, which ſhould remain on till they begin to ſhoot in the ſpring, when they muſt be cut down to five or ſix eyes, at the ſame time taking care not to diſturb the roots. But if the trees are deſigned for ſtandards, you ſhould prune off all the ſmall branches cloſe to the place where they are produced, as alſo the irregular ones which croſs each other; and after having diſplaced theſe branches, you ſhould alſo cut off all ſuch parts of branches, as have by any accident been broken or wounded; but by no means cut off the main leading ſhoots which are neceſſary to attract the ſap from the root, and thereby promote the growth of the tree.

Having thus prepared the trees for planting, you muſt now proceed to place them in the earth; but firſt if the trees have been long out of the ground, ſo that the fibres of the roots are dried, place them eight or ten hours in water, before they are planted, with their heads erect, and the roots only immerſed therein, which will ſwell the dried veſſels of the roots, and prepare them to imbibe nouriſhment from the earth. In planting them, great regard ſhould be had to the nature of the ſoil; for if that be cold and moiſt, the trees ſhould be planted very ſhallow; and if it be a hard rock or gravel, it will be better to raiſe a hill of earth where each tree is to be planted, than to dig into the rock or gravel, and fill it up with earth, as is too often practiſed, by which means the trees are planted, as it were in a tub, and have but little room to extend their roots. The next thing to be obſerved is, to place the trees in the hole in ſuch a manner that the roots may be about the ſame depth in the ground, as before they were taken up: then break the earth fine with a ſpade, and ſcatter it into the hole, ſo that it may fall in between every root, that there may be no hollowneſs in the earth: then having filled up the hole, gently tread down the earth with your feet, but do not make it too hard; which is a great fault, eſpecially if the ground be ſtrong or wet. Having thus planted the trees, they ſhould be faſtened to ſtakes driven into the ground, to prevent their being diſplaced by the wind, and ſome mulch laid about the ſurface of the ground about their roots: as to ſuch as are planted againſt walls, their roots ſhould be placed about five or ſix inches from the wall, to which their heads ſhould be nailed to prevent their being blown up by the wind. The ſeaſons for planting are various, according to the different ſorts of trees, or the ſoil in which they are planted: for the trees whoſe leaves fall off in winter, the beſt time is the beginning of October, provided the ſoil be dry; but if it be a very wet ſoil it is better to defer it till the latter end of February, or the beginning of March; and for many kinds of evergreens, the beginning of April is by far the beſt ſeaſon; though they may be ſafely removed at Midſummer, provided they are not to be carried very far; but you ſhould always make choice of a cloudy wet ſeaſon.

For other obſervations on planting, ſee the articles NURSERY, KITCHEN-GARDEN, ORCHARD, GROVE, &c.

Reverſe PLANTING, a method of planting in which the natural poſition of the plant, or ſhoot is inverted; the branches being ſet into the earth, and the root reared into the air. Dr. Agricola mentions this monſtrous method of planting, which he found to ſucceed very well, in moſt or all ſorts of fruit trees, timber trees, &c. Bradley affirms that he has ſeen a lime tree in Holland growing with its firſt roots in the air, which had ſhot out branches in great plenty, at the ſame time that its firſt branches produced roots and fed the tree. Mr. Fairchild, of Hoxton, has practiſed the ſame with us, and gives the following directions for performing it: make choice of a young tree of one ſhoot, of alder, elm, willow, or any other tree that eaſily takes root by laying; bend the ſhoot gently down into the earth, and ſo let it remain till it has taken

taken root. Then dig about the firſt root, and raiſe it gently out of the ground, till the ſtem be nearly upright, and ſtake it up. Then prune the roots, now erected in the air, from the bruiſes and wounds they received in being dug up, and anoint the pruned parts with a compoſition of two ounces of turpentine, four ounces of tallow, and four ounces of bees wax melted together and applied pretty warm. Afterwards prune off all the buds or ſhoots that are upon the ſtem, and dreſs the wounds with the ſame compoſition, to prevent any collateral ſhootings, that might ſpoil the beauty of the ſtem.

PLANTING, in architecture, the laying the firſt courſe of ſtones, in the foundations of buildings. See FOUNDATION.

PLASENDAL, a fortreſs of Flanders, three miles ſouth-eaſt of Oſtend.

PLASHING *of quickſet-hedges*, an operation very neceſſary to promote the growth and continuance of old hedges. See the article HEDGE.

It is performed in this manner: the old ſtubs muſt be cut off, *&c.* within two or three inches of the ground, and the beſt and longeſt of the middle ſized ſhoots muſt be left to lay down. Some of the ſtrongeſt of theſe muſt alſo be left to anſwer the purpoſe of ſtakes. Theſe are to be cut off to the height at which the hedge is intended to be left; and they are to ſtand at ten foot diſtance one from another: when there are not proper ſhoots for theſe at the due diſtances, their places muſt be ſupplied with common ſtakes of dead wood. The hedges is to be firſt thinned, by cutting away all but thoſe ſhoots which are intended to be uſed either as ſtakes, or the other work of the plaſhing; the ditch is to be cleaned out with the ſpade: and it muſt be now dug as at firſt, with ſloping ſides each way; and when there is any cavity on the bank on which the hedge grows, or the earth has been waſhed away from the roots of the ſhrubs, it is to be made good by facing it, as they expreſs it, with the mould dug from the upper part of the ditch: all the reſt of the earth dug out of the ditch is to be laid upon the top of the bank, and the owner ſhould look carefully into it that this be done; for the workmen, to ſpare themſelves trouble, are apt to throw as much as they can upon the face of the bank; which being by this means overloaded, is ſoon waſhed off into the ditch again, and a very great part of the work undone; whereas what is laid on the top of the bank always remains there, and makes a good fence of an indifferent hedge.

In the plaſhing the quick, two extremes are to be avoided; theſe are, the laying it too low, and the laying it too thick: this makes the ſap run all into the ſhoots, and leaves the plaſhes without ſufficient nouriſhment; which, with the thickneſs of the hedge, finally kills them. The other extreme of laying them too high, is equally to be avoided; for this carries up all the nouriſhment into the plaſhes, and ſo makes the ſhoots ſmall and weak at the bottom, and, conſequently, the hedge thin. This is a common error in the north of England. The beſt hedges made any where in England, are thoſe in Hertfordſhire; for they are plaſhed in a middle way between the two extremes, and the cattle are by that prevented both from croping the young ſhoots, and from going through; and a new and vigorous hedge ſoon forms itſelf. When the ſhoot is bent down that is intended to be plaſhed, it muſt be cut half way through with the bill: the cut muſt be given ſloping, ſomewhat downwards, and then it is to be wounded about the ſtakes, and after this its ſuperfluous branches are to be cut off, as they ſtand out at the ſides of the hedge. If for the firſt year or two the field where a new hedge is made can be ploughed, it will thrive the better for it; but if the ſtubs are very old, it is beſt to cut them quite down, and to ſecure them with good dead hedges on both ſides, till the ſhoots are grown up from them ſtrong enough to plaſh; and wherever void ſpaces are ſeen, new ſets are to be planted to fill them up. A new hedge raiſed from ſets in the common way, generally requires plaſhing about eight or nine years after.

PLASTER, *emplaſtrum*, in pharmacy, is defined to be an external application, of a harder conſiſtence than our ointments: theſe are to be ſpread according to the different circumſtances of the wound, place, or patient, either upon linen or leather. If the part upon which they are to be laid be naturally hairy, it muſt be ſhaved; but that they may ſtick the better, the natural ſhape of the part muſt be conſulted, and the plaſter ſpread and formed accordingly, either round, ſquare, triangular, elliptical, in a lunar form, or in ſhape of the letter

letter T. Some alſo are divided at both ends, and others are perforated in the middle; theſe laſt are of frequent uſe in fractures attended with a wound; for by this contrivance the wound may be cleanſed and dreſſed without removing the plaſter. Theſe plaſters are of different forms, according to the part they are laid on; but they are uſually ſquare, or round; and indeed there is almoſt no part of the body which a plaſter of one of thoſe forms may not be made to ſerve for, if it be notched about the edges with a pair of ſciſſars. See plate CCII. fig. 2.

The uſes of plaſters are various; they are ſerviceable in ſecuring the dreſſings, they alſo forward the maturation of the pus, agglutinate and heal wounds, unite broken bones, heal burns, aſſuage pain, and ſtrengthen weak parts.

The common plaſter is made by boiling one gallon of oil-olive, with five pounds of litharge finely powdered, in about a quart of water, over a gentle fire, and continually ſtirring them, till the oil and litharge are united, and the whole acquires the conſiſtence of a plaſter.

The quickſilver plaſter is made thus: Take of the common plaſter one pound, of quickſilver three ounces, and of the ſimple balſam of ſulphur a dram; and, laſtly, let them be incorporated.

A cephalic is ordered by the college to be made out of two pounds of burgundy pitch, one pound of ſoft labdanum, and yellow roſin and yellow wax, of each four ounces; one ounce of what is called the expreſſed oil of mace: the pitch, roſin, and wax being firſt melted together, add firſt the labdanum, and then the oil of mace.

A ſtrengthening plaſter is made, by adding to two pounds of the common plaſter melted, half a pound of frankincenſe, and three ounces of dragon's blood, both reduced to powder.

A drawing plaſter is made thus: Take yellow roſin and yellow wax, of each three pounds; of tried mutton-ſuet one pound; melt all together, and ſtrain the mixture for uſe.

The bliſtering plaſter is made thus: Take of the drawing plaſter two pounds, of cantharides one pound, of vinegar half a pint; the plaſter being melted, a little before it hardens, ſprinkle in the cantharides, reduced to a very fine powder; then add the vinegar, and beat all well together.

There are ſeveral other forms of plaſters, for which we muſt refer the reader to the diſpenſatories.

PLASTER, among builders, &c. The plaſter of paris is a preparation of ſeveral ſpecies of gypſums, dug near Mont Maitre, a village in the neighbourhood of Paris; whence the name. See the article GYPSUM.

The beſt ſort is hard, white, ſhining, and marbly; known by the names of plaſter-ſtone, or parget of Mount Maitre. It will neither give fire with ſteel, nor ferment with aqua fortis, but very freely and readily calcines in the fire, into a very fine plaſter; the uſe of which in building, and caſting ſtatues, is well known. See the article STUCCO.

As the modern taſte runs greatly into plaſtering, it were to be wiſhed that this art could be brought to its antient perfection. The plaſters of the Romans were exceeding durable; witneſs ſeveral yards of it ſtill to be found on the top of the pont de Garde, near Niſmes. At Venice they uſe a very durable plaſter; but as the ſecret of preparing it, is not known among us, it would be worth while to try whether ſuch a ſubſtance might not be made by boiling the powder of gypſum dry over the fire, for it will boil in the manner of water; and when this boiling or recalcining was over, the mixing with it reſin, or pitch, or both together, with common ſulphur, and the powder of ſea-ſhells. If theſe were all mixed together, and the water added to it hot, and the matter all kept hot upon the fire till the inſtant of its being uſed, ſo that it might be laid on hot, it is poſſible this ſecret might be hit upon. Wax and oil of turpentine may be alſo tried as additions: theſe being the common ingredients in ſuch cements as we have accounts of are the firmeſt. Strong ale-wort is by ſome directed to be uſed, inſtead of water, to make mortar of lime-ſtone be of a more than ordinary ſtrength. It is poſſible, that the uſe of this tenacious liquor in the powdered ingredients of this propoſed plaſter, might greatly add to their ſolidity and firmneſs.

PLASTIC, πλαστικὸς, denotes a thing endued with a formative power, or a faculty of forming or faſhioning a maſs of matter, after the likeneſs of a living being; ſuch a virtue as ſome of the antient epicureans, and perhaps the peripatetics too, imagined to reſide in the earth, or, at leaſt, to have antiently reſided therein, by means whereof, and without any extraordinary

traordinary intervention of a creator, it put forth plants, &c. Some of them ſeem to be of opinion, that animals and even man himſelf, was the effect of this plaſtic power.

PLASTICE, the PLASTIC ART, a branch of ſculpture, being the art of forming figures of men, birds, beaſts, fiſhes, &c. in plaſter, clay, ſtuc, or the like. See the article SCULPTURE.

Plaſtice differs from carving, in that here the figures are made by the addition of what is wanting; but in carving always by ſubtracting what is ſuperfluous. The plaſtic art is now chiefly uſed among us, in fret-work ceilings; but the Italians apply it alſo to the mantlings of chimnies with great figures.

PLAT-VEINS, in the manege, the veins wherein we bleed horſes, one in the lower part of each ſhoulder, and the other in the flat part of the thighs.

PLATS of a ſhip, flat ropes made of rope yarn, and weaved one over the other; they ſerve to ſave the cable from galling in the hawſe, or to wind about the flukes of the anchors, to ſave the pennant of the foreſheet from galling againſt them.

PLATA, a ſmall iſland in the pacific ocean, near the coaſt of Peru, ſituated weſt long. 81°, ſouth lat. 1°. It is alſo the name of a city of Peru, capital of the province of La Plata, ſituated in weſt long. 66° 30′, ſouth lat. 22° 30′: and alſo the name of a great river of Peru, which riſing in the province of La Plata, and running ſouth-eaſt till it joins the river Paragua, diſcharges itſelf into the atlantic ocean, below the city of Buenos Ayres.

PLATANUS, the PLANE TREE, in botany. See the article PLANE TREE.

PLATBAND, in gardening, a border or bed of flowers along a wall, or the ſide of a parterre frequently edged with box, &c. In architecture platband is any flat ſquare-moulding, whoſe height much exceeds its projecture; ſuch are the faces or faſciæ of an architrave, and the platbands of the modillions of a corniche.

PLATBAND of a door or window is uſed for the lintel, where that is made ſquare, or not much arched; theſe platbands are uſually croſſed with bars of iron when they have a great bearing, but it is much better to eaſe them by arches of diſcharge built over them.

PLATBANDS of flutings, are the liſts or fillets between the flutings of columns.

PLATE, in commerce, ſignifies gold or ſilver wrought into veſſels, for domeſtic uſes.

Plate on being imported pays the following duties, *viz.* ſilver plate of France on importation pays 3s. $2\frac{49}{100}$d. the ounce; and, on exportation, draws back, 2s. $1\frac{35}{100}$d. Plate of the Eaſt Indies, pays on importation, 2s. $2\frac{49}{100}$d. the ounce; and, on exportation, draws back, 2s. $1\frac{35}{100}$d. Of all other places, pays on importation, 1s. $5\frac{49}{100}$d. the ounce; and, on exportation, draws back, 1s. $4\frac{35}{100}$d. Silver gilt pays on importation, the ounce, of France, 3s. $10\frac{61\frac{1}{4}}{100}$d. and on exportation, draws back, 2s. $6\frac{18\frac{3}{4}}{100}$d. Of the Eaſt-Indies, pays on importation, 2s. $7\frac{61\frac{1}{4}}{100}$d. and on exportation, draws back, 2s. $6\frac{18\frac{3}{4}}{100}$d. Of all other places pays on importation, 1s. $8\frac{36\frac{1}{4}}{100}$d. and on exportation, draws back, 1s. $6\frac{9\frac{3}{4}}{100}$d. Gold-plate wrought, pays on importation, the ounce, 19s. $1\frac{80}{100}$d. and, on exportation, draws back, 17s. 3d.

PLATE, in heraldry, is a round flat piece of ſilver, without any impreſſion; but as it were formed, ready to receive it.

PLATE is alſo a term uſed by our ſportſmen, to expreſs the reward given to the beſt horſe at our races. See RACE.

PLATES, in gunnery. The priſe plates are two plates of iron on the cheeks of a gun-carriage, from the cape-ſquare to the center, through which the priſe bolts go, and on which the handſpike reſts when it poiſes up the breech of the piece. Breaſt plates are the two plates on the face of the carriage, one on each cheek. Train-plates are the two plates on the cheeks, at the train of the carriage. Dulidge-plates are the ſix plates on the wheel of a gun-carriage, where the fellows are joined together, and ſerve to ſtrengthen the dulidges.

PLATE-LONGE, in the manege, a woven ſtrap, four fathom long, three fingers broad, and one thick; uſed for raiſing the legs of a horſe, and ſometimes for taking him down, in order to facilitate ſeveral operations of the farrier.

PLATEA, the SPOONBILL, in ornithology, a ſpecies of anas, with a flat beak broad and rounded at the end, ſo as to reſemb

reſemble, in ſome degree, a ſpoon, whence the name. See plate CC. fig. 7.

It is of the ſhape, and about the ſize of our common heron. See the articles ANAS and HERON.

PLATFORM, in the military art, an elevation of earth, on which cannon is placed, to fire on the enemy; ſuch are the mounts in the middle of curtins. On the rampart there is always a platform, where the cannon are mounted. It is made by the heaping up of earth on the rampart, or by an arrangement of madriers, riſing inſenſibly, for the cannon to roll on, either in a caſemate, or on attack in the outworks.

All practitioners are agreed, that no ſhot can be depended on, unleſs the piece can be placed on a ſolid platform; for if the platform ſhakes with the firſt impulſe of the powder, the piece muſt likewiſe ſhake, which will alter its direction, and render the ſhot uncertain.

PLATFORM, in architecture, is a row of beams, which ſupport the timber-work of a roof, and lie on the top of the wall, where the entablature ought to be raiſed. This term is alſo uſed for a kind of terrace, or broad, ſmooth, open walk at the top of a building, from whence a fair proſpect may be taken of the adjacent country. Hence an edifice is ſaid to be covered with a platform, when it is flat at top, and has no ridge. Moſt of the oriental buildings are thus covered, as were all thoſe of the antients.

PLATFORM, or ORLOP, in a man of war, a place on the lower deck, abaft the main-maſt, between it and the cockpit, and round about the main capſtan, where proviſion is made for the wounded men in time of action.

PLATIASMOS, a word uſed to expreſs a fault in pronunciation, owing to a perſon's opening his mouth too wide, and then ſpeaking indiſtinctly.

PLATONIC, ſomething that relates to Plato, his ſchool-philoſophy, opinions, or the like; thus, platonic love denotes a pure ſpiritual affection, for which Plato was a great advocate, ſubſiſting between the different ſexes, abſtracted from all carnal appetites, and regarding no other object but the mind and its beauties: or it is even a ſincere diſintereſted friendſhip ſubſiſting between perſons of the ſame ſex, abſtracted from any ſelfiſh views, and regarding no other object than the perſon, if any ſuch love or friendſhip has aught of a foundation in nature.

PLATONIC YEAR, or the GREAT YEAR, is a period of time determined by the revolution of the equinoxes, or the ſpace wherein the ſtars and conſtellations return to their former places, in reſpect of the equinoxes. The platonic year, according to Tycho Brahe, is 25816, according to Ricciolus 25920, and according to Caſſini 24800 years. See PRECESSION.

This period once accompliſhed, it was an opinion among the antients, that the world was to begin anew, and the ſame ſeries of things to turn over again.

PLATONISM, the doctrine and ſentiments of Plato and his followers, with regard to philoſophy, &c.

In phyſics, Plato followed Heraclitus; in ethics and politics, Socrates; and in metaphyſics, he followed Pythagoras; and his diſciples were called academics. See the articles ACADEMIC, &c.

The platonic philoſophy is thought very conſiſtent with the moſaic; and a great many of the primitive fathers follow the opinions of that philoſopher, as being favourable to chriſtianity. Juſtin is of opinion that Plato could not learn many things which he has ſaid in his works from mere natural reaſon, but thinks he might have learned them from the books of Moſes, which he might have read when in Egypt.

PLATTOON, or PLOTTOON, in the military art, a ſmall ſquare body of forty or fifty men, drawn out of a battalion of foot, and placed between the ſquadrons of horſe, to ſuſtain them; or in ambuſcades, ſtraits, and defiles, where there is not room for whole battalions or regiments. Plattoons are alſo uſed when they form the hollow ſquare, to ſtrengthen the angles. The grenadiers are generally poſted in plattoons.

PLATYSMA MYOIDES, in anatomy, a name given by Fallopius to one of the muſcles, called latiſſima colli, by ſome quadratus genæ, and ſubcutaneus by others. See SUBCUTANEUS.

PLAUSUS, among the Romans. See the article ACCLAMATION.

PLAY, *luſus*. See GAME and GAMING.

PLAY, in poetry. See the articles DRAMA, TRAGEDY, COMEDY, &c.

PLAY-HOUSE. See the articles THEATRE, AMPHITHEATRE, &c.

PLEA, in law, is what either party alledges for himſelf in court, in a cauſe there depending; and, in a more reſtrained ſenſe, it is the defendant's anſwer to the plaintiff's declaration.

Pleas are uſually divided into thoſe of the crown and common pleas. Pleas of the crown are all ſuits in the king's name, or in the name of the attorney-general on his behalf, for offences committed againſt his crown and dignity, and againſt his peace; as treaſon, murder, felony, *&c.* Common pleas are ſuch ſuits as are carried on between common perſons, in civil caſes. Theſe pleas may be divided into as many branches as there are actions. To an action there is either a general or a ſpecial plea: and here, a general plea is a general anſwer to the declaration, as in a debt or contract; the general plea is, that he owes nothing; in a debt upon bond, that it is not his deed, or he paid it on the day; in an action on a promiſe, that he made no promiſe; and in a treſpaſs, not guilty. Special pleas are either in bar to the action brought, or in abatement of the writ on which the action is framed. All pleas are to be ſuccinct, without any unneceſſary repetitions, and muſt be direct and pertinent to the caſe.

Court of common PLEAS. See the article COMMON PLEAS.

PLEADING, in law, a ſpeech uttered at the bar, in defence of a cauſe: but, in a ſtricter ſenſe, pleadings are all the allegations of the parties to a ſuit, made after the declaration, till the iſſue is joined. In this ſenſe they expreſs what is contained in the bar, replication, and rejoinder; and not what is in the declaration itſelf. Hence defaults in the matter of declaration are not confined within the miſpleading.

From the conqueſt all pleading was performed in french, till the reign of Edward III; when it was appointed that the pleas ſhould be pleaded in engliſh; but that they ſhould be entered or recorded in latin. At Athens, and even in France and England, formal and prepared pleadings were prohibited, and it was unlawful to amuſe the court with long artful harangues; only it was the ſettled cuſtom here, in important matters, to begin the pleadings with a text out of the holy ſcriptures. It is but of late years that eloquence was admitted to the bar.

PLEASURE and pain, ſays Mr. Locke, are ſimple ideas, which we receive both from ſenſation and reflection; there being thoughts of the mind, as well as ſenſations, accompanied with pleaſure or pain. See the article PAIN.

There are a great many modes of pleaſure and pain, which reſult from the various conſiderations of good and evil, whether natural or moral, and the paſſions thereby excited. See the articles GOOD, EVIL, and PASSIONS.

Pleaſure and pain ſeem to be the means made uſe of, by nature, to direct us in the purſuit of happineſs; ſince pleaſure is annexed to whatever contributes thereto, and pain is the companion of what tends to our ruin. Hence it is, that the pleaſures of a child, a youth, a grown perſon, and an old man, all vary, according to the different things required by nature in each ſtate, whether ſimply for the preſervation of the individual, or for that and propagation jointly.

PLEBEIAN, *plebeius*, any perſon of the rank of the common people. It is chiefly uſed in ſpeaking of the antient Romans, who were divided into ſenators, knights, and plebeians or commons.

PLEBISCITUM, in roman antiquity, a law enacted by the common people, at the requeſt of the tribune, or other plebeian magiſtrate, without the intervention of the ſenate; but more particularly denotes the law which the people made, when they retired to the Aventine mount.

PLECTRONITÆ, in natural hiſtory, the ſame with the conicthyodontes. See the article CONICTHYODONTES.

PLEDGE, *plegius*, in common law, a ſurety, either real or perſonal, which the plaintiff is to find, for proſecuting the ſuit. See the article SURETY.

PLEDGERY, or PLEGGERY, ſuretiſhip, or an anſwering for another perſon.

PLEDGET, BOLSTER, or COMPRESS, *plumaceolus*, in ſurgery, a kind of flat tent, laid over a wound, to imbibe the ſuperfluous humours, and keep it clean. See the article WOUND.

PLEGIIS ACQUIETANDIS, in law, a writ that lies for a ſurety, in caſe he pay not the money at the day.

PLEIADES, *vergiliæ*, in aſtronomy, an aſſemblage of ſtars in the neck of the conſtellation taurus. See TAURUS.

PLENARTY, in law, is when a church-benefice is full of an incumbent. See the article INCUMBENT.

Inſtitution is held to be a good plenarty againſt a common perſon, but not againſt the king, without induction. See the article INSTITUTION and INDUCTION.

PLENARY, ſome thing complete or full.

PLE-

PLENILUNIUM, in aſtronomy, that phaſis of the moon commonly called the full moon. See the article MOON.

PLENIPOTENTIARY, a perſon veſted with full power to do any thing. See the article EMBASSADOR.

The term plenipotentiary is chiefly applied to ſuch miniſters of princes or ſtates as are ſent to treat of peace, &c.

PLENITUDE, *plenitudo*, the quality of a thing that is full, or that fills another.

In medicine, it chiefly denotes a redundancy of blood and humours. See the article PLETHORA.

PLENUM, in phyſics, denotes, according to the carteſians, that ſtate of things, wherein every part of ſpace is ſuppoſed to be full of matter; in oppoſition to a vacuum. See the article VACUUM.

PLEONASM, *pleonaſmus*, *redundantia*, a figure in rhetoric, whereby we uſe words ſeemingly ſuperfluous, in order to expreſs a thought with the greater energy: ſuch as, I ſaw it with my own eyes, &c.

This grammarians uſually reckon a fault in diſcourſe.

PLEROTICS, *plerotica*, in medicine, a kind of remedies that are healing, or that fill up the fleſh: otherwiſe called incarnatives and ſarcotics. See the article SARCOTICS.

PLESKOW, a city of Ruſſia, ſituated at the ſouth end of the lake Worſero: eaſt. long. 28° 30′, and north lat. 57° 20′.

PLESSE, a town of Sileſia, ſituated on the river Viſtula, thirty-five miles eaſt of Troppaw.

PLETHORA, in medicine, a greater redundance of laudable blood and humours than is capable of undergoing thoſe changes which muſt neceſſarily happen for the purpoſes of life, without inducing diſeaſes.

A plethora is cured by veneſection, exerciſe, watchings, a ſharp and acrid diet, after due evacuations, and by a gradual omiſſion of theſe evacuations.

PLETHORIC, *plethoricus*, a perſon abounding with blood, or labouring under a plethora.

PLEVIN, *plevina*, in law, the ſame with pledge. See the article PLEDGE.

PLEURA, in anatomy, a ſmooth, robuſt, and tenſe membrane, adhering to the ribs and to the intercoſtal muſcles, and ſurrounding the whole cavity of the thorax. Its ſtructure reſembles two ſacks, one of which ſurrounds one ſide of the thorax, and the other the other ſide, and each of them contains one of the two lobes of the lungs: from the conjunction of theſe two ſacculi of the pleura, in the middle of the thorax, is formed the mediaſtinum. See MEDIASTINUM.

The pleura is compoſed of a double membrane of a very muſculous ſtructure. Its veſſels are arteries, veins, nerves, and lymphatics. The arteries ariſe from the intercoſtals, the diaphragmatic, and the mammary ones, and are very numerous; the veins, from the veins of the ſame name with thoſe arteries; but all of them diſcharge themſelves into the trunk of the vena azygos, and the upper trunk of the cava. The nerves are from the vertebræ of the thorax and the diaphragmatic ones. The lymphatics all run to the ductus thoracicus.

The uſe of the pleura is to lubricate and ſtrengthen the whole cavity of the thorax.

PLEURISY, πλευρῖτις, in medicine, a violent pain in the ſide, attended with an acute fever, a cough, and a difficulty of breathing.

This diſorder affects all the parts of the internal integuments of the thorax, the whole of the pleura, and the whole of the mediaſtinum; and therefore, when it is ſeated in the membrane internally lining the ribs, it is called a true or internal pleuriſy; but when it chiefly occupies the external parts, and only the intercoſtal muſcles, and thoſe above them, are affected, it is called a ſpurious or baſtard-pleuriſy.

The pleuriſy is moſt predominant between the ſpring and ſummer. It begins with chilneſs and ſhivering, which are ſoon ſucceeded by heat, thirſt, inquietude, and the other common ſymptoms of a fever. After a few hours the patient is ſeized with a violent pricking pain in one of his ſides, about the ribs, which ſometimes extends itſelf towards the ſhoulder-blades, ſometimes towards the back-bone, and ſometimes towards the fore-parts of the breaſt, and this is attended with frequent coughing. The matter which the patient ſpits, is at firſt little and thin, and mixed with particles of blood; but as the diſeaſe advances, it is more plentiful and more concocted, but not without a mixture of blood. The pulſe is remarkably ſtrong, and ſeems to vibrate like a tenſe ſtring of a muſical inſtrument; and the blood drawn from a vein, as ſoon as it is cold, looks like melted ſuet. As to the ſpitting, it is frequently abſent, and hence pleuriſies are diſtinguiſhed into moiſt and dry.

As in all inflammatory fevers, ſo in this, too hot a regimen is to be ſhunned, both with reſpect to the bed-cloaths and the heat of the room; nor muſt the patient be expoſed to the cold air, nor drink things actually cold. Hoffman obſerves that all ſtrong ſudorifics and cathartics are hurtful; and that if the patient has three or four ſtools, the courſe of nature muſt not be ſtopped. The diet ſhould be cooling, relaxing, ſlender, and diluting. Moiſtening things taken warm, are preferable to all others; and hence barley or oatmeal-gruel, ſweetened with honey, and alſo ſweet whey, are proper. If the phyſician is called before the third day, Boerhaave directs a large quantity of blood to be let, from a wide orifice in a large veſſel, and to fetch deep ſighs, or cough, to promote its celerity; and the part affected ſhould be rubbed gently at the ſame time, and the bleeding continued till the pain remits, or the patient is ready to faint. This ſhould be repeated as often as the ſymptoms return, which it was intended to remove, and till the abſence of the white inflammatory pellicle from the ſurface of the blood when cold, ſhews it is time to leave it off. This Huxham confirms by his own experience, and adds, that after the fourth day, bleeding is not ſafe; he likewiſe recommends fomenting the part, which often eaſes the pain, and terminates the diſeaſe: but if it is obſtinate, he recommends ſlight ſcarifications, then cupping, and afterwards a bliſter on the ſame place; which has been ſucceſsful, when the uſual methods failed. The patient's body ſhould be kept open, for which purpoſe emollient clyſters are proper; and he ſhould, at the ſame time, take large quantities of ſtrong, diluting, aperient, and antiſeptic liquors: for this purpoſe, take the leaves of ſcordium, jack-by-the-hedge, and white horehound, each two ounces; boil them in two points of water, with which mix of the oxymel of ſquills, eight ounces; of nitre, three drams; and of treacle-vinegar, one ounce: of this mixture let the patient, every quarter of an hour, take two ounces, as warm as poſſible.

Dr. Mead obſerves, on the treatment of this diſorder, that after drawing as much blood as is neceſſary, draughts with freſh-drawn linſeed-oil, are of great ſervice for eaſing the cough; nitre, for allaying the heat; and for diſſolving the ſizy blood that obſtructs the ſmall canals, wild goat's blood and volatile ſalts; and, laſtly, a bliſter laid on the part affected, in order to draw forth the peccant humour.

A purulent abſceſs or empyema is ſometimes formed in this diſeaſe, for the treatment of which, ſee EMPYEMA.

As to the baſtard-pleuriſy, Hoffman ſays that it is properly a kind of rheumatiſm, and does not require bleeding, unleſs the patient is plethoric, but a diaphoreſis and a more free perſpiration. Lancifi, however, adviſes plentiful bleeding in the arm, ſcarifying the part affected, and cupping: and during the cure, it is neceſſary to keep the body open, and the bowels free from ſpaſms; for which purpoſes, emollient clyſters are proper, with oil of ſweet almonds.

PLEURONECTES, in ichthyology, a genus of malacopterygious fiſhes, the eyes of which are both placed on one ſide of the head, and this is ſometimes the right and ſometimes the left; the branchioſtege membrane contains on each ſide ſix ſmall bones.

To this genus belong the plaiſe, flounder, and turbot, which have both the eyes on the right ſide; and the pearl and ſoal, which have both the eyes on the left ſide.

PLEUROPNEUMONY, in medicine, a diſeaſe partaking of the nature both of a pleuriſy and peripneumony. See the articles PLEURISY and PERIPNEUMONY.

PLEXUS, among anatomiſts, a bundle of ſmall veſſels interwoven in the form of net-work: thus a congeries of veſſels within the brain is called plexus choroides, reticularis, or retiformis. See the article *Plexus* CHOROIDES.

A plexus of nerves is an union of two or more nerves, forming a ſort of ganglion or knot.

PLICA POLONICA, in medicine, a diſeaſe of the hair, almoſt peculiar to Poland and Lithuania, and hence denominated polonica. It conſiſts of a preternatural bulk of the hair, which being firmly conglutinated and wrapped up in inextricable knots, and extended to a monſtrous length, affords a very unſeemly ſpectacle. When theſe are cut off, the blood is diſcharged from them, the head racked with pain, the ſight impaired, and the patient's life frequently endangered.

This diſorder is ſuppoſed to ariſe from the ſordid and naſty manner of life to which theſe people are addicted, and from an hereditary fault conveyed from the parents,

rents, which consists in too great a bulk of the pores and bulbous hairs under the skin of the head: hence the thick and glutinous nutritious juice, produced by their coarse aliments and impure waters, is by heat forced into the cavities of the hairs, and sweating through their pores, produces this terrible disease.

A perfect method of curing this disorder is unknown; undoubtedly because in those parts of Poland, in which this disease is endemial, there have been few physicians, who, from what is commonly known of the nature and cure of the plica polonica, have been able to lay down a rational and judicious plan for treating it. It is certain, that purging and venesection are so far from being beneficial in this disorder, that they often prove hurtful, by throwing the peccant humours into violent commotions, and more effectually distributing them through the whole body. It is therefore most safe and expedient to solicit the peccant matter to the hairs, to which it naturally tends: and this intention, Sennertus says, is most effectually answered by lotions prepared of bear's breech.

PLICATED, something folded together, one part over another; as the leaves of certain plants, *&c.*

PLIMOUTH, a port-town of Devonshire, and a station for the building and laying up of ships of war belonging to the royal navy: west long. 4° 27′, north lat. 50° 26′.

It sends two members to parliament.

PLIMOUTH is also a port-town of New-England, and the capital of a county of the same name: west long. 71°, north lat. 41° 25′.

PLIMTON, a borough-town of Devonshire, situated near the english Channel, thirty six miles south-west of Exeter.

It sends two members to parliament.

PLINIA, in botany, a genus of the polyandria-monogynia class of plants, the flower of which consists of a single petal, divided into five hollow oval segments: the fruit is a large, globose, and unilocular berry; containing a single, very large globose and smooth seed.

PLINTH, ORLE, or ORLO, in architecture, a flat square member, in the form of a brick.

It is used as the foundation of columns, being that flat square table, under the moulding of the base and pedestal at the bottom of the whole order. It seems to have been originally intended to keep the bottom of the original wooden pillars from rotting.

Vitruvius also calls the tuscan abacus, plinth.

PLINTH *of a statue*, &c. is a base, either flat, round, or square, that serves to support it.

PLINTH *of a wall*, denotes two or three rows of bricks advancing out from a wall; or, in general, any flat high moulding, that serves in a front wall to mark the floors, to sustain the eaves of a wall, or the larmier of a chimney.

PLOCE, a figure in rhetoric, whereby a word is repeated by way of emphasis, so as not only to express the subject, but the quality thereof; *e. gr. His wife is a wife indeed!*

PLOCSKOW, the capital of a palatinate of the same name, in Poland, fifty miles north-west of Warsaw.

PLOEN, a city of Holstein, in Germany, twenty-four miles north-west of Lubec: east long. 10°, north lat. 54° 40′.

PLOT, in dramatic poetry, is sometimes used for the fable of a tragedy or comedy, but more particularly the knot or intrigue, which makes the embarras of any piece. The unravelling puts an end to the plot.

PLOT, in surveying, the plan or draught of any field, farm, or manor surveyed with an instrument, and laid down in the proper figure and dimensions.

PLOTTING, among surveyors, is the art of laying down on paper, *&c.* the several angles and lines of a tract of ground surveyed by a theodolite, *&c.* and a chain.

In surveying with the plain-table, the plotting is saved; the several angles and distances being laid down on the spot, as fast as they are taken. See the article PLAIN-TABLE.

But, in working with the theodolite, semicircle, or circumferentor, the angles are taken in degrees; and the distances in chains and links; so that there remains an after-operation to reduce these members into lines, and so to form a draught, plan, or map; this operation is called plotting.

Plotting then is performed by means of two instruments, the protractor and plotting-scale. By the first, the several angles observed in the field with a theodolite, or the like, and entered down in degrees in the field-book, are protracted on paper in their just quantity.

By

By the latter, the ſeveral diſtances meaſured with the chain, and entered down in like manner in the field-book, are laid down in their juſt proportion.

Under the articles protractor and plotting-ſcale, are found ſeverally the uſe of their reſpective inſtruments in the laying down of angles and diſtances: we ſhall here give their uſe conjointly in the plotting of a field, ſurveyed either with the circumferentor or theodolite.

Method of PLOTTING *from the circumferentor.* Suppoſe an encloſure, *e. gr.* A B C D E F G H K (plate CCV. fig. 1.) to have been ſurveyed; and the ſeveral angles, as taken by a circumferentor, in going round the field, and the diſtances as meaſured by a chain, to be found entered in the field-book, as in the following table:

	Deg.	Min.	Cha.	Links.
A	191	00	10	75
B	297	00	6	83
C	216	30	7	82
D	325	00	6	96
E	12	24	9	71
F	324	30	7	54
G	98	30	7	54
H	71	00	7	78
K	161	30	8	22

On a paper of the proper dimenſions, as L M N O (*ibid.*) draw a number of parallel and equidiſtant lines. Their uſe is to direct the poſition of the protractor; the diameter whereof muſt always be laid either upon one of them or parallel thereto; the ſemi-circular limb downwards for angles greater than 180°, and upwards, for thoſe leſs than 180°.

The paper being thus prepared, aſſume a point on ſome meridian, as A, whereon lay the center of the protractor, and the diameter along the line. Conſult the field-book for the firſt angle, *i. e.* for the degrees cut by the needle at A, which the table gives you 191°.

Now ſince 191° is more than a ſemi-circle, or 180, the ſemi-circle of the protractor is to be laid downwards; where keeping it to the point with the protracting pin, make a mark againſt 191; through which mark, from A, draw an indefinite line A *b*. The firſt angle thus protracted, again conſult the book, for the length of the firſt line A B; thus you find 10 chains 75 links. From a convenient ſcale, therefore, on the plotting-ſcale, take the extent of 10 chains 75 links between the compaſſes; and, ſetting one point in A, mark where the other falls in the line A *b*, which ſuppoſe in B: draw therefore the full line A B, for the firſt ſide of the incloſure.

Proceed then to the ſecond angle, and laying the center of the protractor on the point B, with the diameter as before directed, make a mark, as *c*, againſt 297°, the degrees cut at B; and draw the indefinite line B *c*. On this line from the plotting-ſcale, as before, ſet off the length of your ſecond line, *viz.* 6 chains 83 links; which extending from B to the point C, draw the line B C for the ſecond ſide. Proceeding now to the third angle or ſtation, lay the center of the protractor, as before, on the point C; make a mark, as *d*, againſt the number of degrees cut at C; *viz.* 216° 30′; draw the indefinite line C *d*, and thereon ſet off the third diſtance, *viz.* 7 chains 82 links; which terminating, *e. gr.* at D, draw the full line C D for the third ſide.

Proceed now to the fourth angle D; and, laying the center of the protractor over the point D, againſt 325°, the degree cut by the needle, make a mark *e*; draw the dry line D *e*, and thereon ſet off the diſtance 6 chains 96 links, which terminating in E, draw D E for the fourth line, and proceed to the fifth angle, *viz.* E.

Here the degrees cut by the needle being 12° 24′ (which is leſs than a ſemi-circle) the center of the protractor muſt be laid on the point E, and the diameter on the meridian, with the ſemi-diameter limb turned upwards. In this ſituation make a mark, as before, againſt the number of degrees, *viz.* 12° 24′, cut by the needle at E; draw the dry line E *f*, on which ſet off the fifth diſtance, *viz.* 9 chains 71 links, which extending from E to F, draw the full line E F, for the fifth ſide of the incloſure. After the ſame manner proceed orderly to the angles F, G, H, and K; then placing the protractor, making marks againſt the reſpective degrees, drawing indefinite dry lines, and ſetting off the reſpective diſtances as above, you will have the plot of the whole incloſure A B C, *&c.*

Such is the general method of plotting from this inſtrument; but it muſt be obſerved, that in this proceſs the ſtationary lines, *i. e.* the lines wherein the circumferentor is placed to take the angles, and wherein the chain is run to meaſure the diſtances, are properly the lines here plotted. When, therefore, in ſurveying, the ſtationary lines are at any

diſtance

BRITISH MUSEUM

Fig. 1. PLOTTING

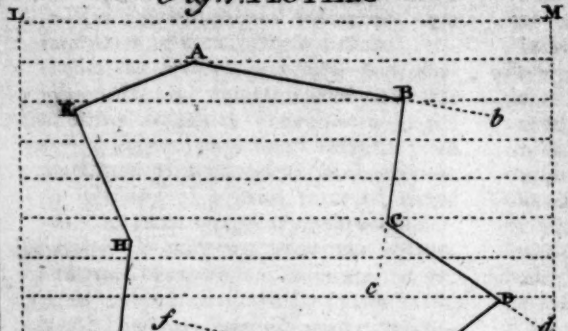


Fig. 3. POINTS

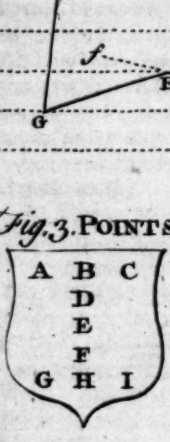


Fig. 4. PORTATE

Fig. 5. POTANCE

Fig. 6. POTENT

Fig. 7. PORCUPINE

Fig. 2. PLOTTING-SCALE.

J. Jefferys sculp.

diſtance from the fence or boundaries of the field, &c. off-ſets are taken, *i. e.* the diſtance of the fence from the ſtationary line is meaſured at each ſtation; and even at intermediate places, if there prove any conſiderable bends in the fence.

In plotting, therefore, the ſtationary lines being laid down as above, the off-ſets muſt be laid down from them, *i. e.* perpendiculars of the proper lengths muſt be let fall at the proper places from the ſtationary lines. The extremes of which perpendiculars, being connected by lines, give the plot deſired. If inſtead of going round the field the angle and diſtances have been all taken from one ſtation, the proceſs of plotting is obvious, from the example above: all here required being to protract, after the manner already deſcribed, the ſeveral angles and diſtances taken from the ſame ſtationary point in the field, from the ſame point or center of the paper. The extremities of the lines thus determined, being then connected by lines, will give the plot required.

PLOTTING-SCALE, a mathematical inſtrument, uſually of wood, ſometimes of braſs, or other matter; and either a foot, or half a foot long.

On one ſide of the inſtrument (plate CCV. fig. 2. n°2.) are ſeven ſeveral ſcales, or lines, divided into equal parts. The firſt diviſion of the firſt ſcale is ſubdivided into ten equal parts, to which is prefixed the number 10, ſignifying that ten of thoſe ſubdiviſions make an inch; or that the diviſions of that ſcale are decimals of inches.

The firſt diviſion of the ſecond ſcale is likewiſe ſubdivided into 10, to which is prefixed the number 16, denoting that ſixteen of theſe ſubdiviſions make an inch. The firſt diviſion of the third ſcale is ſubdivided in like manner into 10, to which is prefixed the number 20; to that of the fourth ſcale is prefixed the number 24; to that of the fifth, 32; that of the ſixth, 40; that of the ſeventh, 48; denoting the number of ſubdiviſions equal to an inch, in each, reſpectively.

The two laſt ſcales are broken off, to make room for two lines of chords. There is alſo on the back-ſide of the inſtrument a diagonal ſcale. See SCALE.

As to the uſe of the plotting, if we were required to lay down any diſtance upon paper, ſuppoſe 6 chains 50 links: draw an indefinite line; then ſetting one foot of the compaſſes at figure 6 on the ſcale, *e. gr.* the ſcale of 20 in an inch, extend the other to 5 of the ſubdiviſions, for the 50 links: this diſtance, being tranſferred to the line, will exhibit the 6 chains 50 links required.

If it be deſired to have 6 chains 50 links take up more or leſs ſpace, take them off from a greater or leſſer ſcale, *i. e.* from a ſcale that has more or fewer diviſions in an inch.

To find the chains and links contained in a right line, *e. gr.* that is juſt drawn, according to any ſcale, *e. gr.* that of 20 in an inch. Take the length of the line in the compaſſes, and applying it to the given ſcale, you will find it extend from the number 6 of the great diviſions, to 5 of the ſmall ones: hence the given line contains 6 chains 50 links.

PLOVER, *pluvialis*, in ornithology, the engliſh name of ſeveral very diſtinct birds; as the green plover, or variegated black and yellowiſh charadrius, about the ſize of the common lapwing; and the grey plover, or blackiſh-brown tringa, with a black beak and green legs, a very beautiful bird. See the articles CHARADRIUS and TRINGA.

Baſtard-PLOVER, the name by which the vanellus, or lapwing, is called in ſeveral parts of the kingdom. See the article VANELLUS.

PLOUGH, in agriculture, a machine for turning up the ſoil, contrived to ſave the time, labour, and expence that without this inſtrument muſt have been employed in digging land, to prepare it for the ſowing of all kinds of grain.

The ſtructure of a plough is various for various kinds of grounds; but the common two-wheeled plough, in plate CCVI. fig. 1. uſed in almoſt all the countries in the ſouth of England, is generally eſteemed the beſt for all ſorts of land, except ſuch miry clays as ſtick to the wheels, and clog them up ſo as to prevent their turning round. It is commonly divided into two parts, the plough-head, and the plough-tail. The plough head contains the two wheels A, B, and their axis, or iron-ſpindle, which paſſes through the box C, and turns round both in it and in the wheels; the two crow-ſtaves D, D, faſtened perpendicularly into the box, having in each two rows of holes, in order to raiſe or ſink the beam, by pinning up or down the pillow E, to encreaſe or diminiſh the depth of the furrow; the gallows F, through which the crow-

ſtaves

ſtaves paſs at top, by mortoiſes into which they are pinned; G the wilds, with its links and crooks of iron, by which the plough is drawn; H the tow-chain, which faſtens the plough-tail to the plough-head, by the collar I at one end, and by the other end paſſing through a hole in the middle of the box, where it is pinned in by the ſtake K; L the bridle-chain, one end of which is faſtened to the beam with a pin, and the other end to the top of the ſtake, which ſtake is held up to the left crow-ſtaff, by the end of the wyth or rope M paſſing round it above, and under the end of the gallows below, or by the end of the bridle-chain itſelf, when that is long enough. The plough-tail conſiſts of the beam, N; the coulter, O; the ſhare, P; and the ſheat, Q; the hinder ſheat, R, paſſing thro' the beam near its end; S the ſhort handle, faſtened to the top of the hinder ſheat by a pin, and to the top of the fore-ſheet by another pin; T the drock, which belongs to the right-ſide of the plough-tail, and to which the ground-weiſt V is faſtened; as is the earth-board, whoſe fore-part W, is ſeen before the ſheat; as alſo the long handle X, whoſe fore-part Y appears before the ſheat, and is faſtened to the drock by the pin at *a*, the other end of which pin goes into the beam. Z is the double reach, which holds up the ſheat, and paſſes through the beam to be faſtened by its ſcrews and nuts at *b* and *c*.

The ſtructure of the four-coultered plough (*ibid.* fig. 2.) is in ſeveral reſpects different from this, though in general founded on it. Its beam is ten feet four inches long, whereas that of the common plough is but eight feet: it differs alſo in ſhape; for as the other is ſtraight from one end to the other, this is ſtraight only from *a* to *b*, and thence turns up, in the manner ſhewn in the plate; ſo that a perpendicular line let down from the corner at *a*, to the even ſurface on which the plough ſtands, would be eleven inches and an half, which is its height in that place; and if another line was let down from the turning of the beam at *b*, to the ſame ſurface, it would be one foot eight inches and a half, which is the height the beam ſtands from the ground at that part; and a third line let down to the ſurface from the bottom of the beam, at that part which bears upon the pillow, will ſhew the beam to be, in that part, two feet ten inches high above the ſurface. At the diſtance of three feet two inches from the end of the beam, at the plough-tail, the firſt coulter, or that next the ſhare, is let through: and at thirteen inches from this, a ſecond coulter is let through; a third at the ſame diſtance from that; and, finally, a fourth at the ſame diſtance from the third. The crookedneſs of the beam is to avoid the too great length of the foremoſt coulters, which would be ſo long if the beam was ſtraight all the way, that they would be apt to bend and be diſplaced, unleſs they were vaſtly thick and clumſy.

The ſheat in this plough is to be ſeven inches broad, and the fixing the ſheat in this, as well as in the common plough, is the niceſt part, and requires the utmoſt art of the maker; for ſuppoſing the axis of the beam, and the left-ſide of the ſhare to be both horizontal, they muſt never be ſet parallel to each other; but the ſtraight ſide of the ſhare muſt make an angle on the left-ſide of the beam, which muſt be very acute, that the tail of the ſhare may preſs leſs againſt the ſide of the trench than the point does: this angle is ſhewn by the pricked lines at the bottom of fig. 1. where the line *e f* is ſuppoſed to be the axis of the beam let down to the ground, and the line *g h*, parallel to the left-ſide of the ſhare. The great thing to be taken care of, is the placing the four coulters, which muſt be ſo ſet that the four imaginary planes deſcribed by the four edges, as the plough moves forwards, may be all parallel to each other, or very nearly ſo; for if any one of them ſhould be very much inclined to, or ſhould recede much from either of the other, then they would not enter the ground together. In order to the placing them thus, the ſecond coulter-hole muſt be two inches and a half more on the right-hand than the firſt; the third muſt be as much more to the right of the ſecond; and the fourth the ſame diſtance to the right of the third: and this two inches and a half muſt be carefully meaſured from the center of one hole to the center of the other. Each of theſe holes is a mortoiſe of an inch and a quarter wide, and is three inches and a half long at the top, and three inches at the bottom. The two oppoſite ſides of the holes are parallel to the top and bottom, but the back is oblique, and determines the obliquity of the ſtanding of the coulter, which is wedged

Fig. 1. PLOUGHS.

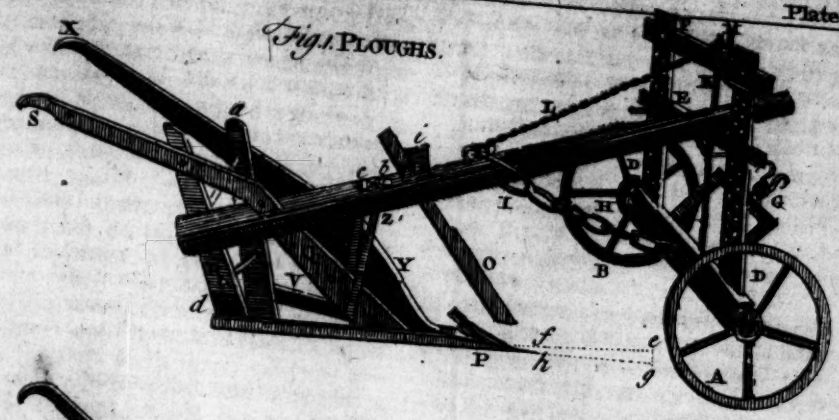


Fig. 2.

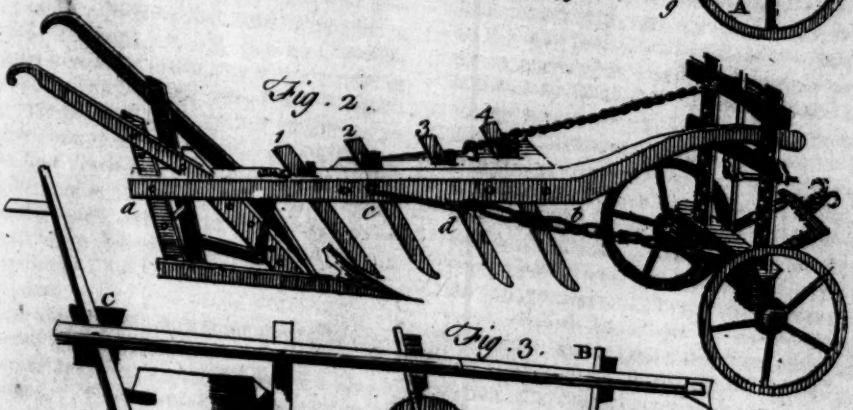


Fig. 3.

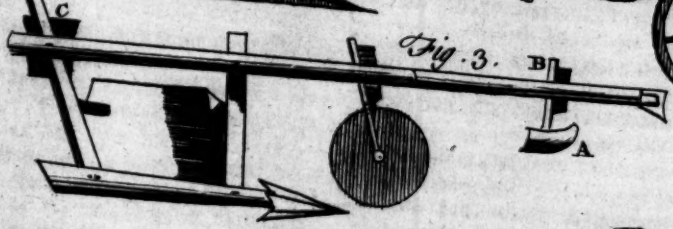


Fig. 4.

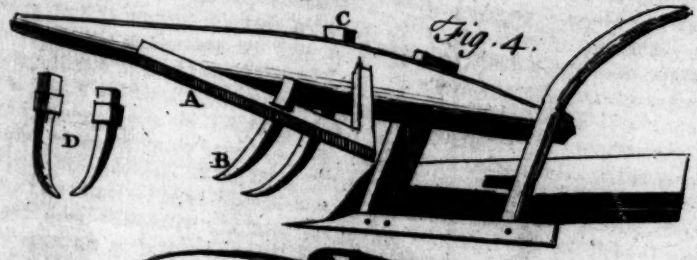
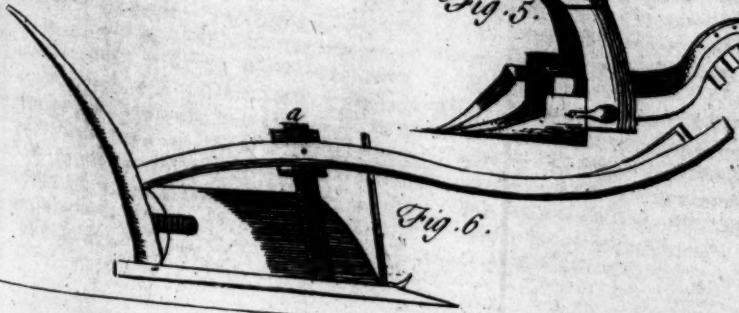


Fig. 5.

Fig. 6.



J. Jefferys sculp

BRITISH MUSEUM

wedged tight up by pieces of wood. The coulters are two feet eight inches long, of which ſixteen inches are allowed for the handle, which is to be thus long that the coulter may be drawn down as the point wears away. As to the wheels, the left-hand wheel is twenty inches diameter, and that on the right-hand, two feet three inches; and the diſtance the wheels are ſet from each other is two feet five inches and a half.

Beſides theſe there are the Lincolnſhire-plough, proper for fenny lands ſubject to weeds and ſedges, and remarkable for the largeneſs of its ſhare, which is frequently a foot broad and very ſharp, (*ibid.* fig. 3.). At A is a foot, which is ſet higher or lower, by a wedge drove in at B; and which keeps the forepart of the plough from going deeper than they would have it. At C there are wedges by which the hinder part is ſet. Inſtead of a coulter there is a wheel with a ſharp edge, which cuts the roots of the graſs or ſedge as it turns round, while the broad ſhare cuts them up at the bottom.

The Caxton or trenching-plough, invented to cut drains about Caxton in Cambridgeſhire, in ſtiff, miry, clay-ground. This plough (*ibid.* fig. 4.) is larger and ſtronger than ordinary: to the beam is fixed a piece of wood at A, in which is a coulter ſet at B, and another ſet in the beam at C, which two coulters ſtand bending inwards as at D, to cut each ſide of the trench. The ſhare is very flat and broad, in order to form the bottom of the trench; and the mould-board is three times the length of other ploughs, in order to caſt the turf a great way from the trench. This plough cuts a trench a foot wide at the bottom, a foot and a half broad at the top, and a foot deep, and it is drawn with twenty horſes.

But the moſt common plough, ſays Mortimer, is the dry-plough, repreſented fig. 6. which is beſt for miry clays, when the land is ſoft; but is extremely bad in ſummer, when the land is hard, becauſe its point will be continually flying out of the ground: it is ſet higher or lower, by wedges at *a*. Fig. 5. is a ſpaniſh plough, with which, and one horſe, they will plow two or three acres of their light lands in a day. We have given a figure of it, merely on account of its ſingularity.

For the hoe and drill-ploughs, invented by Jethro Tull, eſq; ſee his Eſſay on Horſe-hoeing huſbandry.

PLOUGH, among book-binders, is a machine for cutting the edges of the leaves of books ſmooth. See BOOK BINDING.

PLOUGHMAN, the perſon who guides the plough in the operation of tilling. See TILLAGE and PLOUGH.

PLOUGHMAN'S SPIKENARD. See the article SPIKENARD.

PLOUGHING, or PLOWING, in agriculture, turning up the earth with a plough. Ploughing is principally either that of lays or of fallows. Plowing of lays, is the firſt cutting up of graſs-ground for corn, and is a work commonly performed in January. The beſt time for doing it is when the land is wet, becauſe the turf is then ſoft and tough, and will turn up without breaking. In the well turning of this conſiſts the chief part of this ſort of ploughing, which if rightly performed, will lay the turf ſo flat and true, that it can hardly be ſeen where the plough went. This, indeed, depends greatly upon the make of the plough; but if the earth-board does not turn the turf well, ſome nail upon it a ſmall piece of wood to take the upper part of the earth as it riſes upon the earth-board, which cauſes it to fall with the graſs-ſide downwards. Plowing of fallows, called alſo fallowing, is preparing land by ploughing long before it is plowed for ſeed. See the article FALLOWING.

PLUDENTS, a town of Germany, in the county of Tyrol, ſixty-five miles weſt of Inſpruc.

PLUG, a large wooden peg made to ſtop the bottom of a ciſtern, or a hole in a caſk, pipe, or the like.

PLUKNETIA, in botany, a genus of plants, the characters of which are not ſo certainly known as to ſay to which claſs it belongs: the male and female flowers are produced ſeparately on the ſame plant; the corolla is compoſed of four oval and patent petals, and the ſtamina form a ſhort pyramidal body: the fruit is a depreſſed quadrangular capſule, containing a ſingle, roundiſh and compreſſed ſeed.

PLUM-TREE, *prunus*, in botany, a genus of the icoſandria-monogynia claſs of plants, the flower whereof conſiſts of five roundiſh, concave and large petals: the fruit is a roundiſh drupe, marked with a longitudinal furrow, and containing

ing a compreſſed and acute-pointed nut, with the ſutures ſtanding out each way in an edge.

This genus comprehends the plum, cherry, and apricot, three well known kinds of fruit.

Hog's PLUM, a plant called by botaniſts ſpondias. See the article SPONDIAS.

Date PLUM, dioſpyros. See DIOSPYROS.

PLUMAGE, the feathers which ſerve birds for a covering. See FEATHER.

Plumage is, in falconry, particularly underſtood of the feathers under a hawk's wing. Falconers give their hawks ſmall feathers to make them caſt, and theſe alſo they call plumage.

PLUMB-LINE, among artificers, denotes a perpendicular to the horizon; ſo called as being commonly erected by means of a plummet. See PLUMMET.

PLUMBAGO, LEADWORT, in botany, a genus of the pentandria-monogynia claſs of plants, the flower of which conſiſts of a ſingle funnel-faſhioned petal; and its ſeed is ſingle, and contained in the cup.

PLUMBAGO, MOCK-LEAD, or BLACK-LEAD, in mineralogy, a foſſil ſubſtance reſembling lead-ore, much uſed in drawing, and for making pencils. See the article PENCIL.

It is ſomewhat difficult to aſcertain what claſs of minerals black-lead belongs to. Metal it is not, as not being either ductile or even fuſible; nor can it be reckoned among ſtones, for want of hardneſs: it remains, therefore, that it muſt be placed among the earths, though it diſſolve not in water, as moſt earths will, except ſtiff clays and ochres; among the latter whereof Dr. Plott judges it may be reckoned, it ſeeming to be a ſort of cloſe earth, of very fine and looſe parts, ſo burnt as to become black and ſhining, diſcolouring the hands, as all ochres do. Whence the moſt proper name that can be given it, according to this author, is *ochra nigra*, or black ochre. See the article OCHRE.

PLUMBERY, the art of caſting and working lead, and uſing it in buildings, *&c.* See the article LEAD.

As this metal melts very eaſily, it is eaſy to caſt it into figures of any kind, by running it into moulds of braſs, clay, plaſter, *&c.* But the chief article in plumbery is ſheets and pipes of lead; and as theſe make the baſis of the plumber's work, we ſhall here give the proceſs of making them. In caſting ſheet-lead, a table or mould is made uſe of, which conſiſts of large pieces of wood well jointed, and bound with bars of iron at the ends, on the ſides of which runs a frame conſiſting of a ledge, or border of wood, two or three inches thick, and two or three inches high from the mould, called the ſharps: the ordinary width of the mould, within theſe ſharps, is from three to four feet; and its length is ſixteen, ſeventeen, or eighteen feet. This ſhould be ſomething longer than the ſheets are intended to be, in order that the end where the metal runs off from the mould may be cut off, becauſe it is commonly thin, or uneven, or ragged at the end. It muſt ſtand very even or level in breadth, and ſomething falling from the end in which the metal is poured in, *viz.* about an inch, or an inch and a half, in the length of ſixteen or ſeventeen inches. At the upper end of the mould ſtands the pan, which is a concave triangular priſm, compoſed of two planks nailed together at right angles, and two triangular pieces fitted in between them at the ends. The length of this pan is the whole breadth of the mould in which the ſheets are caſt; it ſtands with its bottom, which is a ſharp edge, on a form at the end of the mould, leaning with one ſide againſt it; and on the oppoſite ſide is a handle to lift it up by, to pour out the melted lead; and on that ſide of the pan next the mould, are two iron-hooks to take hold of the mould, and prevent the pan from ſlipping, while the melted lead is pouring out of it into the mould. This pan is lined on the inſide with moiſtened ſand, to prevent it from being fired by the hot metal. The mould is alſo ſpread over, about two thirds of an inch thick, with ſand ſifted and moiſtened, which is rendered perfectly level by moving over it a piece of wood called a ſtrike, by trampling upon it with the feet, and ſmoothing it over with a ſmoothing plane, which is a thick plate of poliſhed braſs, about nine inches ſquare, turned up on all the four edges, and with a handle fitted on to the upper or concave ſide. The ſand being thus ſmoothed, it is fit for caſting ſheets of lead; but if they would caſt a ciſtern, they meaſure out the bigneſs of the four ſides, and having taken the dimenſions of the front, or fore-part, make mouldings by preſſing long ſlips of wood, which contain the ſame mouldings into the level ſand, and form the figures of birds, beaſts, *&c.* by

by preſſing in the ſame manner leaden figures upon it, and then taking them off, and at the ſame time ſmoothing the ſurface where any of the ſand is raiſed up, by making theſe impreſſions upon it. The reſt of the operation is the ſame in caſting either ciſterns or plain ſheets of lead: but before we proceed to mention the manner in which that is performed, it will be neceſſary to give a more particular deſcription of the ſtrike. The ſtrike then is a piece of board about five inches broad, and ſomething longer than the breadth of the mould on the inſide; and at each end is cut a notch, about two inches deep, ſo that when it is uſed, it rides upon the ſharps with thoſe notches. Before they begin to caſt, the ſtrike is made ready by tacking on two pieces of an old hat on the notches, or by ſlipping a caſe of leather over each end, in order to raiſe the under ſide about one eighth of an inch, or ſomething more, above the ſand, according as they would have the ſheet to be in thickneſs; then they tallow the under edge of the ſtrike and lay it acroſs the mould. The lead being melted, it is ladled into the pan, in which, when there is a ſufficient quantity for the preſent purpoſe, the ſcum of the metal is ſwept off with a piece of board to the edge of the pan, letting it ſettle on the ſand, which is by this means prevented from falling into the mould at the pouring out of the metal. When the lead is cool enough, which is known by its beginning to ſtand with a ſhell or wall on the ſand round the pan, two men take the pan by the handle, or elſe one of them lift it up by a bar and chain fixed to a beam in the ceiling, and pour it into the mould, while another man ſtands ready with the ſtrike, and, as ſoon as they have done pouring in the metal, puts on the mould, ſweeps the lead forward, and draws the overplus into a trough prepared to receive it. The ſheets being thus caſt, nothing remains but to planiſh the edges in order to render them ſmooth and ſtrait; but if it be a ciſtern it is bent into four ſides, ſo that the two ends may join the back, where they are ſoldered together, after which the bottom is ſoldered up.

The method of caſting thin ſheets of lead. Inſtead of ſand, they cover the mould with a piece of woolen ſtuff nailed down at the two ends to keep it tight, and over this lay a very fine linen cloth. In this proceſs great regard is had to the juſt degree of heat, ſo as that the lead may run well and yet not burn the linen. This they judge of by a piece of paper, for it takes fire in the liquid lead if it is too hot, and if it be not ſhrunk and ſcorched a little, it is not hot enough. They have here a ſtrike different from that deſcribed above: it is a wooden caſe, only cloſed on three ſides: it is pretty high behind, but the two ſides, like two acute angles, ſtill diminiſh to the tip from the place where they are joined to the third or middle piece, where they are of the ſame height therewith, *viz.* ſeven or eight inches high: the width of the middle makes that of the ſtrike, which again makes that of the ſheet to the caſt. This ſtrike is placed at the top of the mould, which in that part is firſt covered with a paſteboard that ſerves as a bottom to the caſe, and prevents the linen from being burnt while the lead is pouring in. The ſtrike is now filled with lead, according to the quantity to be uſed; which done, two men, one at each ſide, draw the ſtrike down the mould with a velocity greater or leſs, as the ſheet is to be more or leſs thick.

The method of caſting pipes without ſoldering. To make theſe pipes they have a kind of little mill, with arms or levers to turn it withal. The moulds are of braſs, and conſiſt of two pieces, which open and ſhut by means of hooks and hinges, their inward caliber, or diameter, being according to the ſize of the pipe to be made, and their length is uſually two feet and a half. In the middle is placed a core, or round piece of braſs or iron, ſomewhat longer than the mould, and of the thickneſs of the inward diameter of the pipe. This core is paſſed through two copper-rundles, one at each end of the mould, which they ſerve to cloſe; and to theſe is joined a little copper tube about two inches long, and of the thickneſs the leaden pipe is intended to be of. By means of theſe tubes the core is retained in the middle of the cavity of the mould. The core being in the mould, with the rundles at its two ends, and the lead melted in the furnace, they take it up in a ladle and pour it into the mould by a little aperture at one end, made in the form of a funnel. When the mould is full they paſs a hook into the end of the core, and turning the mill, draw it out; and then opening the mould take out the pipe. If they deſire to have the pipe lengthened,

they put one end of it in the lower end of the mould, and paſs the end of the core into it; then ſhut the mould again, and apply its rundle and tube as before, the pipe juſt caſt ſerving for rundle, &c. at the other end. Things being thus replaced they pour in freſh metal, and repeat the operation till they have got a pipe of the length required.

For making pipes of ſheet-lead, the plumbers have wooden cylinders, of the length and thickneſs required, and on theſe they form their pipes by wrapping the ſheet around them, and ſoldering up the edges all along them. See PIPE.

PLUMBUM, LEAD, in natural hiſtory. See the article LEAD.

PLUME, a ſet or bunch of oſtrich-feathers pulled out of the tail and wings, and made up to ſerve for ornaments in funerals, &c.

Among ſportſmen, plume is the general colour or mixture of the feathers of a hawk, which ſhews her conſtitution. See the article HAWK.

PLUME, or PLUMULE, in botany, a little membrane of the grain or ſeed of a plant, being that which, in the growth of the plant, becomes the ſtem or trunk thereof. See the article SEED, &c.

PLUMERIA, RED JASMINE, in botany, a genus of the pentandria-monogynia claſs of plants, the corolla of which conſiſts of a ſingle funnel-like petal, with a long tube, and divided into five oblong ſegments at the limb: the fruit is compoſed of two jointed and ventricoſe follicles, formed of a ſingle valve each, and containing numerous oblong ſeeds. See plate CXCIX. fig. 5.

PLUMMET, PLUMB RULE, or PLUMB-LINE, an inſtrument uſed by carpenters, maſons, &c. in order to judge whether walls, &c. be upright planes, horizontal, or the like. It is thus called from a piece of lead, *plumbum*, faſtened to the end of a chord, which uſually conſtitutes this inſtrument. Sometimes the ſtring deſcends along a wooden ruler, &c. raiſed perpendicularly on another; in which caſe it becomes a level. See LEVEL.

PLUMMING, among miners, is the method of uſing a mine-dial, in order to know the exact place of the work where to ſink down an air-ſhaft, or to bring an adit to the work, or to know which way the load inclines when any flexure happens in it.

It is performed in this manner: A ſkilful perſon, with an aſſiſtant, and with pen, ink, and paper, and a long line and a ſun-dial, after his gueſs of the place above ground, deſcends into the adit or work, and there faſtens one end of the line to ſome fixed thing in it, then the incited needle is let to reſt, and the exact point where it reſts is marked with a pen: he then goes on farther in the line ſtill faſtened, and at the next flexure of the adit he makes a mark on the line by a knot or otherwiſe; and then letting down the dial again, he there likewiſe notes down that point at which the needle ſtands in this ſecond poſition. In this manner he proceeds, from turning to turning, marking down the points, and marking the line, till he comes to the intended place; this done, he aſcends and begins to work on the ſurface of the earth what he did in the adit, bringing the firſt knot in the line to ſuch a place where the mark of the place of the needle will again anſwer its pointing, and continues this till he comes to the deſired place above ground, which is certain to be perpendicularly over the part of the mine into which the air-ſhaft is to be ſunk.

PLUMOSE, ſomething formed in the manner of feathers, with a ſtem and fibres iſſuing from it on each ſide: ſuch are the antennæ of certain moths, butterflies, &c.

PLUNGER, in mechanics, the ſame with the forcer of a pump. See FORCER.

PLURAL, *pluralis*, in grammar, an epithet applied to that number of nouns and verbs which is uſed when we ſpeak of more than one thing; or that which expreſſes a plurality or number of things. See the article NUMBER.

In latin, &c. both nouns and verbs have uſually diſtinct terminations to their different numbers: in Engliſh, nouns ſubſtantive uſually become plural by the addition of *s*, or *es*, to the ſingular. Nouns adjective are the ſame in both numbers; and in verbs the number is diſtinguiſhed by that of the pronouns or perſons.

PLURALITY, *pluralitas*, a diſcrete quantity, conſiſting of two or a greater number of the ſame kind: thus we ſay a plurality of gods, &c.

Hence plurality of benefices, or livings, is where the ſame clerk is poſſeſſed of two or more ſpiritual preferments, with cure of ſouls. In a plurality of livings, the firſt, *ipſo facto*, becomes void; on which account, the patron may preſent to it, provided the clerk be not qualified by

by diſpenſation, &c. to hold more livings than one, in regard the law ſtrictly enjoins reſidence; this being impoſſible where the ſame perſon has more than one living, in different places. As the power for granting diſpenſations for the holding two benefices, &c. is veſted in the king, it is held that, in theſe caſes, the archbiſhop's diſpenſation, and the king's confirmation of it, are neceſſary to hold pluralities: but a deanery ſhall not be taken to be a benefice, ſo as to need a diſpenſation, on the dean's having another ſpiritual preferment; alſo a parſonage and vicarage make no plurality.

PLURIES, in law, the name of a writ which iſſues after two former writs have gone out without any effect; for firſt, an original writ, called a capias, goes out, which not being obeyed, there goes out an alias, which likewiſe failing, the pluries iſſues.

PLUS, in algebra, a character marked thus +, uſed for the ſign of addition. See the article CHARACTER.

PLUSH, in commerce, &c. a kind of ſtuff having a ſort of velvet knap, or ſhag, on one ſide, compoſed regularly of a woof of a ſingle woolen thread and a double warp, the one wool, of two threads twiſted, the other goats or camels hair; though there are ſome pluſhes entirely of worſted, and others compoſed wholly of hair.

Pluſh is manufactured, like velvet, on a loom with three treadles; two of theſe ſeparate and depreſs the woolen warp, and the third raiſes the hair-warp, upon which the workman throwing the ſhuttle, paſſes the woof between the woolen and hair-warp; and afterwards laying a braſs-broach, or needle, under that of the hair, he cuts it thereon with a knife deſtined for that uſe; conducting the knife on the broach, which is made a little hollow all its length, and thus gives the ſurface of the pluſh an appearance of velvet. See VELVET.

There are other kinds of pluſh, all of ſilk; ſome of which have a pretty long knap on one ſide, and ſome on both.

PLUSQUAMPERFECT, in grammar. See the article PRETERIT.

PLUVIAL, *pluviale*, antiently ſignified a hood or cloak, which eccleſiaſtics, chiefly religious, wore in the country to ſhelter themſelves from the rain. The word is now uſed, in the romiſh church, for a large hood worn by the chantor and ſubdeacon at maſs and veſpers, &c. It covers the whole man, and is fixed before with two claſps.

PLUVIALIS, in zoology, the name whereby the latin authors call the plover. See the article PLOVER.

PNEUMATICS, called alſo PNEUMATOLOGY and PNEUMATOSOPHY, among ſchoolmen, the doctrine and contemplation of ſpirits and ſpiritual ſubſtances, as God, angels, and the human ſoul, in which ſenſe pneumatics are the ſame with what we otherwiſe call metaphyſics. See the article METAPHYSICS.

PNEUMATICS is more commonly uſed among us, for that part of natural philoſophy which treats of the nature and properties of the air; the doctrine and laws of which will be found under the articles AIR, ATMOSPHERE, PRESSURE, ELASTICITY, GRAVITY, COMPRESSION, RAREFACTION, EXPANSION, FLUID, &c.

PNEUMATIC ENGINE. See AIR-PUMP.

PNEUMATOCELE, *hernia flatulenta*, or WINDY RUPTURE, in ſurgery and medicine, a ſpecies of hernia, which ſeveral authors aſſure us occurs in practice. The ſigns by which they tell us it may be diſcovered are, 1. That upon handling the ſcrotum it feels like a bladder diſtended with wind; and that, therefore, 2. it ſeems to be much lighter than if it contained any humour, appearing alſo pellucid at the approach of a candle; and, 3. if it be ſtruck by a ſillup of the finger, it ſounds like a bladder which is diſtended with wind, and ſtruck in the ſame manner. However, Heiſter is of opinion that theſe authors have miſtaken either the hyderocele or enterocele for the pneumatocele, and ſeems to be more confirmed in this opinion, not only becauſe the ſymptoms and cure of this diſorder, with which they acquaint us, agree exactly with theſe of the hyderocele, but becauſe that in all his practice he never obſerved any thing like this diſorder; this makes him at leaſt ſuſpect that the caſe does not ſo often occur as ſome would inſinuate: but whenever it is met with, he directs to proceed in the cure as follows. Let the tumour be treated externally with warm and diſcutient medicines, as in the hyderocele, together with fomentations and plaſters; and internally may be taken carminative and gentle purges: but if theſe take no effect, and the tumour ſtill increaſes, or continues the ſame, the ſcro-

tum ſhould then be perforated with the trochar, and its contents thereby diſcharged, which will demonſtrate whether it be wind or water.

PNEUMATOMACHI, πνευματομαχοι, antient heretics, ſo called becauſe they oppoſed the divinity of the holy ſpirit, placing him in the number of creatures.

PNEUMATOSIS, πνευματωσις, a term which ſome authors uſe for the generation or formation of animal ſpirits in the brain.

PNEUMONICS, in pharmacy, medicines proper in diſeaſes of the lungs, in which reſpiration is affected. Of this number are ſulphur, lungwort, hyſſop, ground-ivy, and colt's-foot: they are uſed in phthiſes, aſthmas, peripneumonies, pleuriſies, &c.

PO, a great river of Italy, riſing in the Alps, and running firſt eaſt, ſoon after turns directly north, through Piedmont, where it receives the Doria: then paſſing north-eaſt, it diſcharges itſelf by ſeveral channels into the gulph of Venice.

POA, MEADOW-GRASS, in botany, a genus of the triandria-digynia claſs of plants, the corolla whereof is compoſed of two valves, of an ovato-acuminated figure, hollow, compreſſed, and ſomewhat longer than the cup, and without awns. It ſupplies the place of a pericarpium; and adheres every way to the ſeed, which is ſingle, of an oblong figure, compreſſed, and pointed at each end.

This is the moſt common of all graſſes with us, and makes principally the green covering of moſt of our fields and meadows.

POCHARD, in ornithology, the anas, with grey wings and a black rump. See the article ANAS.

POCK. See the article POX.

POCKET, in the woolen trade, a word uſed to denote a large ſort of bag, in which wool is packed up to be ſent from one part of the kingdom to another. The pocket contains uſually twenty-five hundred weight of wool.

POCKET-*inſtruments* and *medicines*, in ſurgery. See the articles INSTRUMENT and MEDICINES.

POCKLINGTON, a market-town in the eaſt riding of Yorkſhire: ſituated twelve miles ſouth-eaſt of York.

POD, among botaniſts, a term uſed to expreſs a pericarpium, conſiſting of two valves, which open from the baſe to the point, and are ſeparated by a membranaceous partition, from which the ſeeds hang by a kind of funiculus umbilicalis. See the article PERICARPIUM.

PODAGRA, in medicine, the gout in the feet. See the article GOUT.

PODALIA, a province of Poland, bounded by Volhinia and the ruſſian Ukrain, on the north and north-eaſt; by Budziac Tartary, on the ſouth-eaſt; by the river Nieſter, which ſeparates it from Beſſarabia and Moldavia, on the ſouth-weſt; and by the province of red-Ruſſia, on the north-weſt.

PODOMETER, or PEDOMETER, the ſame with perambulator. See the article PERAMBULATOR.

PODARIA, in zoology, a diviſion, order, or ſeries of wingleſs inſects, with ſhort bodies, and not very numerous legs; comprehending the puceron, pediculus, acarus, ſpider, ſquill, &c. See the article PUCERON, &c.

PODENSTEIN, a town of Germany, in the circle of Franconia: ſituated in eaſt long. 11° 35′, north lat. 49° 50′.

PODERIS, in antiquity, a robe hanging down to the foot, but chiefly uſed to expreſs a linen garment, a ſurplice, or a ſhirt.

The jewiſh prieſts were covered with this kind of ſurplice during their attendance in the temple; this being the proper habit of their order.

PODEX, in anatomy, &c. the ſame with anus or fundament. See ANUS.

PODOPHYLLUM, the MAY-APPLE, in botany, a genus of the polyandria-monogynia claſs of plants, the flower of which conſiſts of nine hollow and rounded petals, folded or plicated at the rim, and ſmaller than the cup: the fruit is an unilocular capſule of an oval figure, containing numerous and roundiſh ſeeds.

This plant is otherwiſe called anapodophyllum. See the article ANAPODOPHYLLUM, and plate XVII. fig. 2.

PODURA, the PUCERON, in zoology. See the article PUCERON.

POEM, Ποιημα, a compoſition in verſe of a due length and meaſure. See the articles VERSE and MEASURE.

Poems are generally denominated from the ſubject matter, as the apobaterion, epibaterion, epinicion, epithalamium, genethliac, elegiac, ſatiric, epitaph, panegyric, lyric, paſtoral, &c. and others from the manner of narration, as epic, dramatic, &c. to which may be added, odes, eclogues, and idylliums. To this head may alſo be referred ſeveral other compoſitions of a leſs ſerious kind, as the

the acroſtic, enigma, anagram, cento, echo, &c. See each under its proper head: APOBATERION, &c.

The Abbé Du Bos obſerves, in regard to poems, that ſome are intereſting in general, others in particular; that the beauties of execution alone do not conſtitute a good poem: that the defects of poems are leſs diſcernable than thoſe of a picture; that our diſlike falls only on the bad part of a poem; that every kind of poem has ſomething particular in its ſtyle; that by the beauty of the ſtyle we muſt judge of poems; that it muſt be a long time before the merit of a good poem is diſtinguiſhed; and finally, that the character of the poetic ſtyle has always decided the good or bad ſucceſs of poems, even of thoſe which by their length ſeem to have the greateſt dependance on the œconomy of the plan, on the diſtribution of the action, and on the decency of the manners.

POESY, the ſame with poetry. See the article POETRY.

POET, ποιητης, the author of a poem. See the article POEM.

Homer, Virgil, Milton, and Taſſo, are reckoned the chief, almoſt the only, epic poets. Sophocles, Euripides, Shakeſpear, Otway, Corneille, and Racine, the beſt tragic poets. Ariſtophanes, Menander, Plautus, Terence, Fletcher, Johnſon, Molliere, &c. the chief comic poets. Horace, Cowley, and Malherbe, excelled as lyric poets: and Juvenal, Perſius, Regnier, Boileau, Dryden, and Oldham, as ſatiric poets.

POETICAL, ſomething that relates to poetry or poets, in which ſenſe we ſay poetical genius, poetical licence, &c.

POETICAL *Juſtice*, is chiefly uſed in reſpect of the drama, to denote a diſtribution of rewards and puniſhments to the ſeveral perſons at the cataſtrophe or cloſe of a piece, anſwerable to the ſeveral characters they appeared in. See the articles CHARACTER and CATASTROPHE.

POETICAL *riſing and ſetting of the ſtars*. The three kinds of riſing and ſetting, *viz.* the coſmical, acronical, and helical, were made by the antient poets, referring the riſing, &c. of the ſtars to that of the ſun. See COSMICAL, &c.

POETICS, the doctrine of poetry, or the laws and rules of conducting pieces, or compoſitions of poetry, ſuch is Ariſtotle's poetics, a work much valued.

POETRY, the art of compoſing poems, or pieces in verſe; or, as defined by Voſſius, the art of repreſenting actions in metre.

Voſſius thinks that love was the firſt occaſion of poetry, which is not improbable, conſidering that this affection is coeval with mankind, is univerſal, and naturally productive of poetry; yet it undoubtedly owes its increaſe and progreſs to religion: Dacier indeed calls it the offspring of religion; and it is certain, in the earlieſt ages of the world, that it was uſual to ſing hymns to the honour of the gods upon ſolemn feſtivals. Du Bos thinks that poetry has been employed in all ages, even by the moſt unpoliſhed nations, to preſerve the memory of paſt events. Its principal aim is to flatter our ſenſes and imagination: for, according to Plato, it awakes the ſpiritual empire of the ſoul. Every kind of poetry charms us in proportion to its object, ſays Du Bos; and to be very affecting, it ought to be very exact. It is not the ſame with poetry as with other arts, for an ignorant perſon may judge of poetry by the impreſſion it makes on him: whence all men have a right to give their opinion concerning a piece of poetry, and this judgment ought to be founded on experience rather than on argumentation. Poetry is an art where every thing ſhould pleaſe. It is not enough to exhibit nature, which in certain places and circumſtances is rude and unpleaſant, but the poet muſt chuſe in her what is beautiful from what is not: whence a poet ought to chuſe, for the ſubject of his imitation, ſomething that is naturally affecting. There is a particular rhetoric for poetry, which conſiſts in diſcerning very preciſely what ought to be ſaid figuratively, and what to be ſpoken ſimply; and in knowing where ornament is required, and where not: yet the ſtyle ſhould be copious, and every ſpecies of writing in this art ſhould have a diction proper to itſelf. The qualifications then neceſſary for poetry, or thoſe which form a good poet, are ſeldom found united in one perſon: he muſt have an extraordinary genius, great natural gifts, a wit juſt, piercing, ſolid, and univerſal; an underſtanding clear and diſtinct; an imagination neat and pleaſant; an elevation of ſoul that depends not on art, or ſtudy, and which is purely a gift of heaven, and muſt be ſuſtained by a lively ſenſe and vivacity, a great judgment to conſider wiſely of things,

and

and a vivacity to expreſs them with that grace and abundance which gives them beauty. In fine, to accompliſh a poet, is required a temperature of wit and fancy, of ſtrength and ſweetneſs, of penetration and delicacy; but, above all, he muſt have a ſovereign eloquence, and a profound capacity. Theſe are the qualities that muſt concur together to form the genius of a poet, and ſuſtain his character. The rules of poetry and verſifying are taught by art, and acquired by ſtudy; but this force and elevation of thought, which Horace calls ſomething divine, and which alone makes the poetry of any value, muſt be derived from nature; or, according to Ariſtotle, from ſome happy tranſports, to which that author gives the name of madneſs. Hence the critics conclude, the end of poetry is to pleaſe; its cauſe, either the excellence of the poet's genius, or a poetical fury and tranſport of the ſoul, manageable by the judgment; its matter, long and ſhort ſyllables, and feet compoſed hereof, with words furniſhed by grammar; and its form the arrangement of all theſe things in juſt and agreeable verſe, expreſſing the thoughts and ſentiments of the author after the manner already mentioned. But after all, how narrow are all theſe bounds, if we conſider poetry in the light wherein the works of Homer and Virgil have ſet it. This, which is therefore diſtinguiſhed by the name of the greater poetry, in contradiſtinction to the low and ſimple, or verſification, conſiſts principally in fiction, or the invention of fables, in the expreſſing of things by allegories, and metaphors, and in the inventing of actions, under which the truths which the poet has to teach, may be agreeably diſguiſed. See MYTHOLOGY, *&c.*

The laws of epic and dramatic poetry, ſee under the articles EPIC, CHARACTER, INVOCATION, CATASTROPHE, DRAMATIC, ACT, SCENE, SENTIMENTS, *&c.*

For the lower ſorts of poetry, ſee the articles ODE, SONG, EPIGRAM, ELEGY, SATYR, *&c.*

POGGE, *cataphractus*, in ichthyology. See the article CATAPHRACTUS.

POGGIO IMPERIAL, a city of Italy, in the dutchy of Tuſcany, ſituated ſixteen miles ſouth of Florence.

POICTIERS, the capital of Poictou, in France, ſituated on an eminence, near the river Clain: eaſt long. 15′, north lat. 46° 40′.

POICTOU, a territory of France, in the province of Orleanois, ſituated ſouth of the river Loire, being bounded by the provinces of Anjou and Britany on the north, by Touraine and Berry on the eaſt, by Santoign, Angoumois, and Aunis on the ſouth, and by the ocean on the weſt. It is one hundred and fifty miles long, and ſeventy broad.

POINCIANA, in botany, a genus of the decandria-monogynia claſs of plants, the corolla whereof conſiſts of five unequal petals; the four upper petals are roundiſh and nearly equal, the fifth is larger, diſform, and crenated; the fruit is an oblong depreſſed pod, with ſepta; the ſeeds are ſingle, and placed lengthwiſe in the pod. See plate CCXI. fig. 2.

POINSON, in the manege, a little point, or piece of ſharp-pointed iron, fixed in a wooden-handle, which the cavalier holds in his right hand, when he means to prick a leaping horſe in the croup, or beyond the end of the ſaddle, in order to make him jerk out behind.

POINT, a term uſed in various arts.

POINT, *punctum*, in geometry, as defined by Euclid, is a quantity which has no parts, or which is indiviſible. Points are the ends or extremities of lines. If a point be ſuppoſed to be moved any way, it will, by its motion, deſcribe a line. See the article LINE.

POINT *of contrary flexure*. See the article FLEXURE.

POINT, in phyſics, the leaſt ſenſible object of ſight, marked with a pen, point of a compaſs, or the like. Of ſuch points all phyſical magnitude conſiſts. This phyſical point is the ſame with what Mr. Locke calls the point ſenſible, and which he defines to be the leaſt particle of matter, or ſpace, we can diſcern. He adds, that to the ſharpeſt eye, this is ſeldom leſs than thirty ſeconds of a circle, where of the eye is the center.

POINT, in grammar, a character uſed to mark the diviſions of diſcourſe. A point proper, is what we otherwiſe call a full ſtop or period. See PERIOD.

For the other points, ſee the articles COMMA, COLON, and SEMICOLON.

For the points of interrogation and admiration, ſee the articles INTERROGATION and ADMIRATION.

The points, or vowel points, in the hebrew grammar, are certain characters which, in the writings of that language ſerve to mark the vowels. The antiquity of theſe points make the ſubject of

celebrated controverſy, ſome maintaining their origin to be the ſame with that of the hebrew language; and others aſſerting them to have been firſt introduced by Eſdras, after the babyloniſh captivity, when he compiled the canon, tranſcribed the books into the preſent chaldee character, and reſtored the purity of the hebrew text. Some will have them invented by the doctors of the ſchool of Tiberias, uſually called the maſſoretes, five or ſix hundred years after Chriſt.

POINT, in muſic, a mark or note antiently uſed to diſtinguiſh the tones or ſounds: hence we ſtill call it ſimple counter-point, when a note of the lower part anſwers exactly to that of an upper; and figurative counter-point, when any note is ſyncopated, and one of the parts makes ſeveral notes or inflections of the voice, while the other holds on one. See the article COUNTER-POINT.

We ſtill uſe a point, to raiſe the value of a note, and prolong its time by one half, *e. g.* a point added to a ſemibreve inſtead of two minims, make it equal to three; and ſo of the other notes. See TIME.

POINT, in aſtronomy, a term applied to certain points or places, marked in the heavens, and diſtinguiſhed by proper epithets.

The four grand points or diviſions of the horizon, *viz.* the eaſt, weſt, north, and ſouth, are called the cardinal points. See HORIZON, EAST, WEST, *&c.*

The zenith and nadir are the vertical points; the points wherein the orbits of the planets cut the plane of the ecliptic, are called the nodes: the points wherein the equator and ecliptic interſect, are called the equinoctial points; particularly, that whence the ſun aſcends towards the north pole, is called the vernal point; and that by which he deſcends to the ſouth pole, the autumnal point. The points of the ecliptic, where the ſun's aſcent above the equator, and deſcent below it, terminate, are called the ſolſticial point; particularly the former of them, the eſtival or ſummer-point; the latter, the brumal or winter-point.

POINT *of the horizon*, or *compaſs*, in navigation and geography. See the articles HORIZON and COMPASS.

POINT is alſo uſed for a cape or headland, jutting out into the ſea: thus ſeamen ſay, two points of land are in one another, when they are ſo in a right line againſt each other, as that the innermoſt is hindered from being ſeen, by the outermoſt.

POINT, in perſpective, is uſed for various parts or places, with regard to the perſpective plane. See PERSPECTIVE.

POINTS, in heraldry, are the ſeveral different parts of an eſcutcheon, denoting the local poſitions of any figure. There are nine principal points in an eſcutcheon as repreſented in pl. CCV. fig. 3. where A ſhews the dexter chief; B, the preciſe middle chief; C, the ſiniſter chief; D, the honour-point; E, the feſs-point, called alſo the center; F, the nombril-point, that is, the navel-point; G, the dexter baſe; I, the ſiniſter baſe; H, the preciſe middle baſe.

Columbier makes the points and their ſituations ſymbolical. As the ſeveral bearings in an eſcutcheon are ſo many types repreſenting the commendable actions of the perſon they are given to, ſo the eſcutcheon itſelf repreſents the body of the man that performed them; and the points or parts ſignified by theſe letters, the principal parts of his body: thus A, B, C, repreſent the head, in which the three great faculties reſide; D, the neck, where ornaments are chiefly borne; E, the heart, *&c.* See ESCUTCHEON.

Point is alſo the name of an ordinary, ſomething like a pile, riſing frequently from the bottom of the eſcutcheon to the top, very narrow, and only taking up two thirds of the point of the eſcutcheon. When the point ariſes from the baſe, it is peculiarly called point in point. Point inverted, is when it deſcends from the chief downwards, poſſeſſing two thirds of the chief, but diminiſhing as it approaches the point of the eſcutcheon, though without touching it. Point in bend, or point in bar, is when the point is placed tranſverſe in the ſituation of a bend or bar. When it comes from the ſides of the eſcutcheon, it is alſo called the point dexter or ſiniſter, according to its ſituation. The point dexter is commonly reputed an abatement due to a braggadocio; point-champion-ten, due for killing a priſoner after quartet demanded; point in point, a diminution belonging to a coward; point-plane, an abatement belonging to a lyar, *&c.* See the articles DIMINUTION, *&c.*

POINT is alſo uſed in heraldry for the loweſt part of the eſcutcheon, which uſually terminates in a point.

POINT-CHAMPAIN. See CHAMPAIN.

POINT is alſo an iron or ſteel-inſtrument, uſed with ſome variety in ſeveral arts. Engravers, etchers, cutters in wood, *&c.*

uſe points to trace their deſigns on the copper, wood, ſtone, &c. See the articles ENGRAVING, &c.

POINT, in the manufactories, is a general term, uſed for all kinds of laces, wrought with the needle; ſuch are the point de Venice, point de France, point de Genoa, &c. which are diſtinguiſhed by the particular oeconomy and arrangement of their points.

Point is ſometimes uſed for lace woven with bobbins, as engliſh point, point de Malines, point d'Havre, &c.

POINT, in architecture, See ARCH.

POINT, in poetry, denotes a lively briſk turn, or conceit, uſually found or expected at the cloſe of an epigram.

POINT-BLANK, in gunnery, denotes the ſhot of a gun, levelled horizontally. See the article GUNNERY.

POINTED, in heraldry. A croſs pointed, is that which has the extremities turned off into points by ſtraight lines.

POINTING, in grammar, the art of dividing a diſcourſe, by points, into periods and members of periods, in order to ſhew the proper pauſes to be made in reading, and to facilitate the pronunciation and underſtanding thereof. See the articles PUNCTUATION and PRONUNCIATION.

POINTING, in war, the levelling a cannon, or mortar, ſo as to play againſt any certain point. See the articles GUNNERY, QUADRANT, &c.

POINTING, among ſeamen, marking on the chart in what part or place the veſſel is.

POINTING *the cable*, in the ſea-language, is untwiſting it at the end, leſſening the yarn, twiſting it again, and making all faſt with a piece of marline, to keep it from ravelling out.

POIRINO, or POVERINO, a town of Italy, in the province of Piedmont, fifteen miles ſouth-eaſt of Turin.

POISON, in medicine, a malignant quality in ſome animal, vegetable, or mineral body, which renders it hurtful and even mortal to thoſe who take it.

There are three eſſential marks of poiſons, which diſtinguiſh them from other things that are noxious to human bodies. The firſt is, that they conſiſt of moſt ſubtile parts, and are conſequently pernicious in a ſmall quantity. The ſecond, that they in a ſhort time prevent the regular motions of the ſolids and fluids throughout the body, and induce the moſt grievous ſymptoms, and even death itſelf. And the third, that they exerciſe their cruelty on the moſt ſubtile fluids, and the moſt nervous parts. Poiſons are of various kinds, and operate in various manners; ſome by diſſolving the blood, others by coagulating it, and others by corroding and deſtroying the ſolid parts. All the three kingdoms have poiſons peculiar to themſelves; but the animal kingdom affords the moſt ſubtile, which are communicated by the bite of mad or venomous beaſts, when they are angered. The mineral kingdom produces arſenicals and mercurials. And the vegetable, herbs and plants of a moſt acrid, noxious, and deleterious quality, ſuch as the moſt violent cathartics and narcotics. Every ſort of poiſon ſeems to have an effect peculiar to itſelf; thus arſenic occaſions the moſt cruel torments, convulſions, mortification of the coats of the inteſtines: the ſeeds of datura induce madneſs or abſolute ſtupidity: opium brings on ſleepineſs, and a torpor on the mind: the berries of deadly nightſhade produce madneſs, rage, or folly: litharge, unwarily taken, cauſes a convulſive colic, with an obſtinate coſtiveneſs: the bite of a mad dog occaſions the dread of water: the venom induced by the ſting of a tarantula, produces wonderful effects; for the patient is delighted with muſical inſtruments, and when he hears their ſounds, immediately falls to capering: the ſting of a ſcorpion produces a ſudden chilneſs and exceeding cold ſweats. The mineral kingdom furniſhes very few real poiſons; the only natural one is cobalt; the factitious are arſenic, corroſive ſublimate, and glaſs of antimony. The moſt dangerous vegetable poiſons are the true hemlock, wolf's bane, the deadly nightſhade, henbane, and datura, to which may be added the roots of hemloc-dropwort.

Milk mixed with oil, is an excellent remedy againſt all corroſive poiſons. Hoffman ſays, that he once prevented the death of ten young perſons, who had taken among them almoſt two ounces of arſenic in water gruel, which in a ſhort time produced the higheſt anxieties, and corroding tortures, by oil of ſweet almonds and milk. They took at leaſt ten quarts a piece, which they vomited up again before the reaching to vomit ceaſed. The ſame author alſo affirms, that milk, in a large quantity, is an univerſal remedy againſt all poiſons that kill by inflammation, as hemloc does; and, if taken in time, will prevent their dreadful conſequences. Allen thinks a vomit with warm water and oil, taken in large draughts,

draughts, and often repeated, will be of great ſervice; as alſo warm water with freſh butter; milk and oil, or milk and butter: but for fat broths, which he alſo recommends, or any thing elſe which requires ſome time for the preparation, they only allow the poiſon to take deeper root, and therefore ought not to be waited for. If the above things will not provoke the patient to vomit, oxymel of ſquills, ſalt of vitriol, or a decoction of tobacco may be uſed, as having a more immediate effect. It is hardly ſafe to give even the moſt gentle cathartic. The ſtomach being thus emptied of all, or as much as poſſible of the hemloc, recourſe muſt be had to generous wine and alexipharmics, ſuch as venice treacle, the bezoardic powder, &c. When there is a ſuſpicion that the coats of the ſtomach or inteſtines are corroded, or ulcerated, it will not be proper for the patient to uſe ſpices or vinegar, nor to indulge in drinking too much wine; but to take a decoction of barley with raiſins, or a decoction of china-root, ſaſſafras, &c. The ſame method is moſt likely to anſwer when any deleterious herb or root has been eaten by miſtake, though the particular ſpecies ſhould not be known: and Hoffman affirms, that when the patient has been ſtupified by narcotics, the beſt remedies are vomits mixed with oil. For the more effectual remedies for the bite of a mad dog, viper, rattle-ſnake, &c. ſee the articles HYDROPHOBIA, VIPER, RATTLE-SNAKE, &c.

To POISON *a piece*, with gunners, is the ſame as to clog and nail it up.

POISON-OAK, *toxicodendron*, in botany. See the article TOXICODENDRON.

POISSY, a town of France, fifteen miles north-weſt of Paris.

POLA, a port town of Iſtria, ninety miles ſouth-eaſt of Venice.

POLACHIA, a province ſituated in the middle of Poland, on the river Bug, eaſtward of Maſſovia or Warſovia.

POLAEDRASTYLA, in natural hiſtory, the name of a genus of cryſtals, compoſed of many planes, and having no column. See the article CRYSTAL.

The bodies of this genus are cryſtals compoſed of two octangular pyramids, joined baſe to baſe, and conſequently the whole body conſiſting of ſixteen planes. Of this genus there are only two known ſpecies. 1. A brown kind, with ſhort pyramids, found in conſiderable plenty in Virginia on the ſides of hills. And, 2. A colourleſs one, with longer pyramids. This has yet been found only in one place, which is the great mine at Goſſelaer, in Saxony, and there uſually lies at great depths.

POLAND, a large kingdom of Europe, ſituated between 16° and 34° eaſt longitude, and between 46° and 57° north latitude; bounded by Ruſſia on the north and eaſt; by Beſſarabia, Moldavia, Tranſilvania, and Hungary on the ſouth; and by Pomerania, Brandenburg, and Sileſia on the weſt; being almoſt ſquare, and ſeven hundred miles over either way.

The conſtitution of Poland is a mixed monarchy, in which the nobility and gentry ſeem to have the greateſt ſhare, whence it is frequently called a republic. The king is elective by the whole body of the gentry, who oblige him to ſwear to what conditions they pleaſe.

POLAR, in general, ſomething relating to the poles of the world, or poles of the artificial globes: thus we meet with polar circles, polar dial, polar projection, &c. See the articles CIRCLE, DIAL, &c.

POLARITY, the quality of a thing conſidered as having poles; but chiefly uſed in ſpeaking of the magnet. See the article MAGNET.

POLE, πολος, in aſtronomy, one of the extremities of the axis, on which the ſphere revolves. See SPHERE and AXIS.

Theſe two points, each 90° diſtant from the equinoctial or equator, are by way of eminence called the poles of the world; and the extremities of the axes of the artificial globes, correſponding to theſe points in the heavens, are termed the poles thereof. See the article GLOBE.

POLE, in ſpherics, a point equally diſtant from every part of the circumference of a great circle of the ſphere, as the center is a plane figure; or it is a point of 90° diſtant from the plane of a circle, and in a line, called the axis, paſſing perpendicularly through the center. The zenith and nadir are the poles of the horizon; and the poles of the equator are the ſame with thoſe of the ſphere.

POLES *of the ecliptic*, are two points on the ſurface of the ſphere, 23° 30′ diſtant from the poles of the world, and 90° diſtant from every part of the ecliptic. See the article EARTH.

POLES, in magnetics, are two points of a loadſtone, correſponding to the poles of the world; the one pointing to the north, the other to the ſouth. See MAGNET.

POLE, or VERTEX *of a glaſs*, in optics, is the

the thickeſt part of a convex, or the thinneſt of a concave-glaſs. If the glaſs be truly ground, the pole will be exactly in the middle of its ſurface.

POLE, PERCH, or ROD, in ſurveying, is a meaſure containing ſixteen feet and a half.

POLE, or POLAR STAR, is a ſtar of the ſecond magnitude, the laſt in the tail of urſa minor. Its longitude Mr. Flamſteed makes 24° 14′ 41″; its latitude, 66° 4′ 11″.

The nearneſs of this ſtar to the pole, whence it happens that it never ſets, renders it of vaſt ſervice in navigation, &c. for determining the meridian line, the elevation of the pole, and, conſequently, the latitude of the place, &c. See the article LATITUDE.

POLE-CAT, *putorius*. See PUTORIUS.

POLEMICAL, in matters of literature, an appellation given to books of controverſy, eſpecially thoſe in divinity.

POLEMONY, *polemonium*, in botany, a genus of the pentandria-monogynia claſs of plants, with a monopetalous flower, divided into five roundiſh ſegments at the limb: the fruit is a roundiſh capſule, conſiſting of three cells, and containing a great many ſeeds in each.

The leaves of this plant are accounted deterſive.

POLEMOSCOPE, in optics, a kind of reflecting perſpective-glaſs invented by Hevelius, who commends it as uſeful in ſieges, &c. for diſcovering what the enemy is doing, while the ſpectator lies hid behind an obſtacle. See PERSPECTIVE.

Its deſcription is this: the interval *bc*, (pl. CCVII. fig. 1.) between the object-glaſs and the ſpeculum, is enlarged by a tube, of a length ſufficient to project the ſpeculum beyond the obſtacle that covers the obſerver. And for a further convenience of looking forward, as it were, he propoſes to place another plane ſpeculum *fg*, at the other end of the tube, to reflect the rays through a hole *kl* in its ſides, in a direction *ao*, parallel to the incident rays *Qc*; and to place the concave eye-glaſs in this hole. By this means, the object will ſtill appear upright, and magnified juſt as much as if the two ſpeculums were removed, and the ſame eye-glaſs was placed in the axis of the tube: for in the rays *Qc*, *oa*, produced through the ſpeculums *de*, *fg*, take *ci* = *cb*, and *ab* = *ab*; and ſuppoſing rays to flow both ways through *b*, the center of the object-glaſs, after reflection from the ſpeculums they will diverge from the points *h*, *i*. Let two of them fall upon the object at P and R, and ſince ∠ P *i* R (or *die*) = ∠ *dbe* (or *fbg* = *fbb*) if the eye-glaſs was removed, the object would appear under the ſame angle *fbg* or *kbl*, as it would appear under to the naked eye placed at *i*; but the reflected rays *fk*, *gl*, after refractions into *km*, *ln*, through the eye-glaſs *kl*, are inclined in the ſame angle to each other, as they would be if the ſpeculum *fg* being removed they had been refracted through the ſame eye-glaſs placed in the axis of the tube, at the ſame diſtance from *b* as it is now from *h*: and by tracing an oblique ray, R *ebfkm*, it is manifeſt that the object appears upright; it alſo appears in the ſame poſture, with reſpect to right and left, as to the naked eye. However, the length of the perſpective *ab* muſt not be very great, otherwiſe it will take in ſo little at one view, as to make it difficult to find an object.

POLERON, one of the Banda, or nutmeg-iſlands, in the Indian-ocean: eaſt long. 128°, ſouth lat. 4°.

POLESIA, a province of Poland, bounded by Polachia and Lithuania, on the north; and by Volhinia, on the ſouth.

POLESIN DE ROVIGO, a province of Italy, ſituated north of the Po, on the gulph of Venice.

POLESWORTH, a market-town, twenty miles north of Warwick.

POLIANTHES, in botany, a genus of the hexandria-monogynia claſs of plants, with a monopetalous, funnel-faſhioned flower; and a roundiſh capſule for its fruit, with a great many ſemi-orbiculated ſeeds.

POLICANDRO, an iſland of the Archipelago, in eaſt longitude 25°, north latitude 36° 30′.

POLICASTRO, a biſhop's ſee of the kingdom of Naples, ſixty miles ſouth-eaſt of Naples.

POLICY, or POLITY, in matters of government. See the article POLITY.

For policies of aſſurance, or inſurance, on ſhips, houſes, lives, &c. ſee the article INSURANCE.

Theſe contracts of inſurance, termed policies, are now made either at public or private offices; the inſurances made on lives or liberties muſt be paid according to the tenor of the agreement, becauſe theſe ſorts of policies admit of no average. Where the words of a policy are

Fig. 1. POLEMOSCOPE.

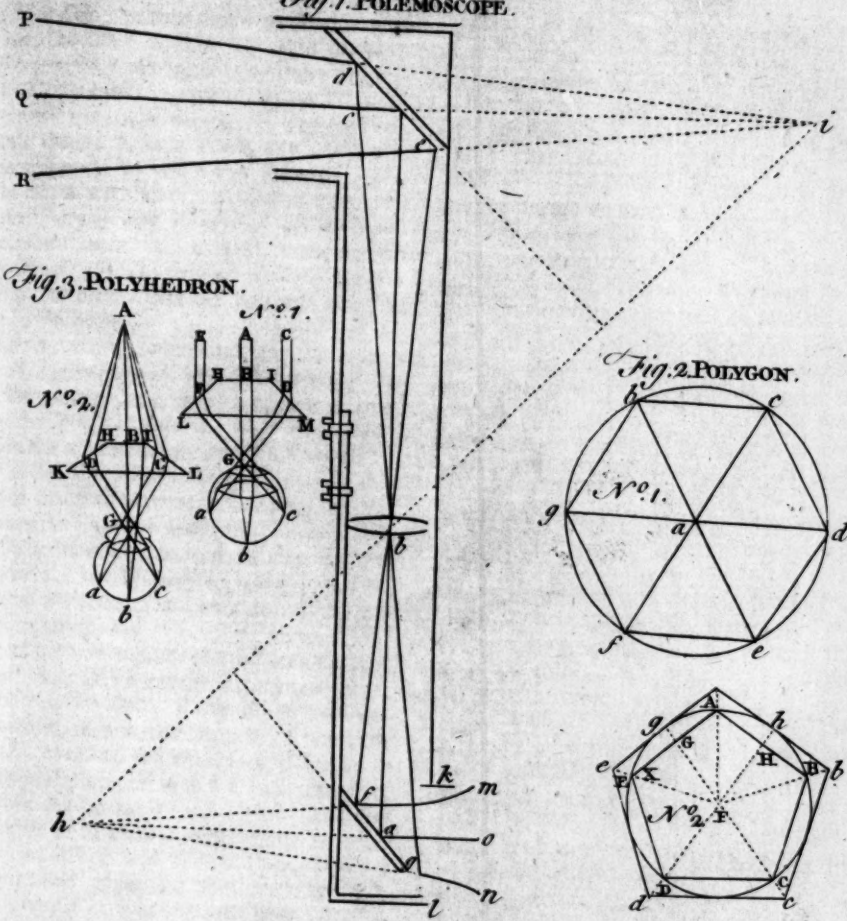
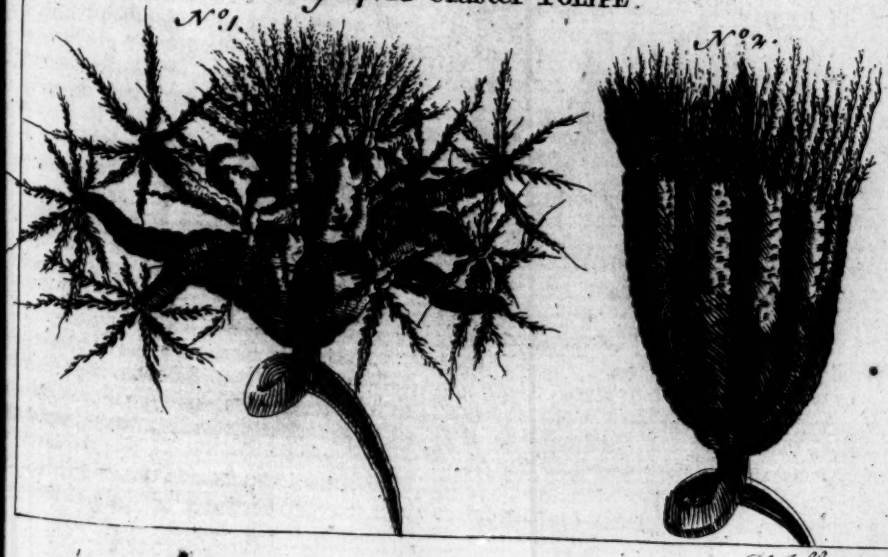


Fig. 3. POLYHEDRON.

Fig. 2. POLYGON.

Fig. 4. A Cluster-POLYPE.



J. Jefferys sculp

BRITISH MUSEUM

" the ſhip warranted to depart with convoy," it ſhall be intended that ſhe keep with convoy during the voyage, if poſſible; and if ſhe depart willingly from the convoy, it is fraud. Either ſuppreſſing the truth, or alleging any falſehood, is ſufficient to diſcharge the policy; it being a general rule, that the inſured ſhall inform the inſurer of all material circumſtances which have come to his knowledge at the time of making the policy, in order that the contract may be fairly adjuſted.

POLICY, among letter-founders, denotes a certain proportion, obſerved among the letters that compoſe a font; or a rule, whereby to regulate the number of each. See the articles LETTER and FONT.

POLISHER, or BURNISHER, among mechanics, an inſtrument for poliſhing and burniſhing things proper to take a poliſh. The gilders uſe an iron-poliſher to prepare their metals before gilding, and the blood-ſtone to give them the bright poliſh after gilding.

The poliſher uſed by the makers of ſpurs and bits, &c. is partly iron, partly ſteel, and partly wood; it conſiſts of an iron-bar with a wooden handle at one end, and a hook at the other, to faſten it to another piece of wood held in the vice, while the operator is at work. In the middle of the bow, withinſide, is what is properly called the poliſher, being a triangular piece of ſteel with a tail, whereby it is riveted to the bow.

The poliſhers, among cutlers, are a kind of wooden wheels made of walnut-tree, about an inch thick, and of a diameter at pleaſure, which are turned round by the great wheel; upon theſe they ſmooth and poliſh their work with emery and putty.

The poliſhers for glaſs conſiſt of two pieces of wood; the one flat, covered with old hat, the other long and half-round, faſtened on the former, whoſe edge it exceeds on both ſides by ſome inches, which ſerve the workmen to take hold of, and to work backwards and forwards by.

The poliſhers, uſed by ſpectacle-makers, are pieces of wood a foot long, ſeven or eight inches broad, and an inch and a half thick, covered with old beaver-hat, whereon they poliſh the ſhell and horn-frames their ſpectacle glaſſes are to be ſet in.

POLISHING, in general, the operation of giving a gloſs or luſtre to certain ſubſtances, as metals, glaſs, marble, &c. See the articles METAL, GLASS, &c.

The operation of poliſhing optic-glaſſes, after being properly ground, is one of the moſt difficult points of the whole proceſs. See GLASS and GRINDING.

Before the poliſhing is begun, it is proper to ſtretch an even well-wrought piece of linen over the tool, duſting thereupon ſome very fine tripoli. Then taking the glaſs in your hand, run round forty or fifty times upon the tool, to take off the roughneſs of the glaſs about the border of it. This cloth is then to be removed, and the glaſs to be poliſhed upon the naked tool, with a compound powder made of four parts tripoli mixed with one of fine blue vitriol; ſix or eight grains of which mixture, is ſufficient for a glaſs five inches broad. This powder muſt be wetted with eight or ten drops of clear vinegar, in the middle of the tool; being firſt mixed and ſoftened thoroughly with a very fine ſmall mullet. Then with a nice bruſh, having ſpread this mixture thinly and equably upon the tool, take ſome very fine tripoli, and ſtrow it thinly and equably upon the tool ſo prepared; after which take the glaſs to be poliſhed, wiped very clean, and apply it on the tool, and move it gently twice or thrice in a ſtraight line backwards and forwards; then take it off, and obſerve whether the marks of the tripoli, ſticking to the glaſs, be equably ſpread over the whole ſurface thereof; if not, it is a ſign that either the tool or glaſs is too warm; in which caſe, you muſt wait a while and try again, till you find the glaſs takes the tripoli every where alike. Then you may begin to poliſh boldly, there being no danger of ſpoiling the figure of the glaſs, which in the other caſe would infallibly happen. This is Mr. Huygens's method; but it ought to be obſerved, that almoſt every operator has a peculiar one of his own, and of which ſome of them make a mighty ſecret.

Sir Iſaac Newton no where expreſsly deſcribes his method of poliſhing optic-glaſſes; but his method of poliſhing reflecting metals, he thus deſcribes in his optics. He had two round copper-plates, each ſix inches in diameter, the one convex the other concave, ground very true to one another. On the convex one he ground the object-metal, or concave which was to be poliſhed, till it had taken the figure of the convex, and was ready for a

poliſh.

poliſh. He then pitched over the convex very thinly, by dropping melted pitch upon it, and warming it to keep the pitch ſoft, whilſt he ground it with the concave copper wetted to make it ſpread evenly all over the convex, till it was no thicker than a groat piece; and after the convex was cold, he ground it again, to give it as true a figure as poſſible. He then ground it with very fine putty, till it made no noiſe; and then upon the pitch he ground the object-metal with a briſk motion for two or three minutes; when laying freſh putty upon the pitch, he ground it again till it had done making a noiſe, and afterwards ground the object-metal upon the pitch as before: and this operation he repeated, till the metal was perfectly poliſhed.

POLITICAL, in general, ſomething relating to policy or government. See the article GOVERNMENT.

Political arithmetic is the application of arithmetical calculation, to political ſubjects, as the public revenues, number of people, extent and value of lands, taxes, trade, manufactures, &c. of any commonwealth.

The calculations of this kind, which Sir William Petty attempted, Dr. Davenant gives ſome good reaſons why many of his numbers are not to be entirely depended on; and therefore he advances others of his own, founded on the obſervation of Mr. Greg. King.

The land of England, he ſays, is 39 millions of acres; the number of people about 5,545,000, increaſing about 9000 every year, allowance being made for plagues, &c. wars, ſhipping, plantations. The people in London he reckons at 530,000; thoſe in the other cities and market towns, 870,000; and thoſe in the villages and hamlets, at 4,100,000; the yearly rent of the land he accounts to be 10,000,000 l. that of the houſes and buildings, 2,000,000 l. *per annum*; the produce of all kinds of grain, he reckons to be worth 9,075,000 l. in a moderate plentiful year; the rent of the corn lands annually 2,000,000 l. and their net produce above 9 000,000 l. the rent of the paſtures, meadows, woods, foreſts, commons, heaths, &c. 7,000,000 l. The annual produce in butter, cheeſe, and milk, about 2,500,000 l. The value of wool, yearly ſhorn, about 2,000,000 l. Of horſes yearly bred, about 250,000 l. Of the fleſh yearly conſumed, about 3,350,000 l. Tallow and hides, about 600,000 l. Hay yearly conſumed by horſes, 1,300,000 l. By other cattle, 1,000,000 l. The timber yearly felled for building, 500,000 l. Wood yearly burnt, &c. 500,000 l. The land of England is now about ſeven acres one quarter to each inhabitant. The value of the wheat, rye, and barley, neceſſary for the ſuſtenance of England, at leaſt, 6,000,000 l. *per ann.* The value of the woollen manufacture made here is about 8,000,000 l. *per annum*, and our exports of all kinds of woollen manufactures, above 2,000,000 l. *per annum*. The annual income of England, on which the people live, and out of which taxes of all kinds are paid, is now about 43,000,000 l. that of France, 81,000,000 l. and Holland, 18,250,000 l.

Major Grant, in his obſervations on the bills of mortality, computes that there are 39,000 ſquare miles of land in England; that in England and Wales there are 4,600,000 ſouls; that the people of London are about 640,000, and one fourteenth part of the people of England. That in England and Wales are about 10,000 pariſhes, and 25 millions of acres being about 4 acres to every head. That but 64 out of a hundred of the children born are living at 6 years old; but 40 at 16; but 25 at 26; but 16 at 36; but 10 at 46; but 6 at 56; but 3 at 66; but 1 at 76. And that London doubles itſelf in about 64 years.

Sir William Petty, in his diſcourſe about duplicate proportion, ſays, that it is found by experience that there are more perſons living between 16 and 26, than of any other age; and thence he infers, that the ſquare roots of every number of men's ages under 16, ſhew the proportion of the probability of ſuch perſons reaching the age of 70. See the article LIFE. Thus it is four times more likely, that one of 16 years of age lives to be 70, than a child of one year old; it is three as probable that one of 9 years lives to be 70, as ſuch a new-born child, &c. That the odds is 5 to 4, that one of 25 dies before one of 16; and ſo on, as the ſquare roots of the ages.

Dr. Hally has made a very exact eſtimate of the degrees of the mortality of mankind, from a curious table of the births and burials at the city of Breſlau the capital of Sileſia, and an attempt to aſcertain the price of annuities upon lives. See the article MORTALITY. From the whole he makes the two

lowing very good obſervations: 1. How unjuſtly we uſe to complain of the ſhortneſs of our lives; for that it appears that one half of thoſe that are born, do not live above 17 years; and, 2. That the growth and increaſe of mankind is not ſo much ſtinted by any thing in the nature of the ſpecies, as it is from the curious difficulty moſt people make of venturing on the ſtate of marriage; and, therefore, that celibacy ought to be every way diſcouraged by all wiſe governments; and thoſe who have numerous families of children encouraged by good laws, ſuch as the jus trium liberorum, &c. among the Romans.

POLITICS, the firſt part of oeconomy, conſiſting in the well governing and regulating the affairs of a ſtate, for the maintenance of the public ſafety, order, tranquillity, and morals. See POLITY.

POLITIO, or POLIZZI, a town of Sicily, in the Val Demona, thirty miles eaſt of Palermo.

POLITY, or POLICY, πολιτεια, denotes the peculiar form and conſtitution of the government of any ſtate or nation; or, the laws, orders, and regulations relating thereto.

Polity differs only from politics, as the theory from the practice of any art. See the articles LAW, GOVERNMENT, &c.

Some divide polity into agoranomy, or the regulations relating to mercantile affairs; and aſtynomy, or thoſe which concern the judiciary government of the citizens: ſome add other branches, *viz.* thoſe relating to eccleſiaſtical and military affairs.

POLL, a word uſed in antient writings for the head: hence to poll, is either to vote or to enter down the names of thoſe perſons who give in their votes at an election.

POLL-MONEY, a capitation or tax impoſed by the authority of parliament on the head or perſon either of all indifferently, or according to ſome known mark of diſtinction.

POLLACK, in ichthyology, the name of two different ſpecies of gadus; *viz.* the cole-fiſh or raw-pollack, and the whiting-pollack. See the articles GADUS, COLE-FISH, and WHITING.

POLLARD, among hunters, a ſtag which has caſt his horns.

POLLARD, or POLLENGER, in agriculture, ſignifies a tree that has been frequently polled, or lopped.

POLLEX, in anatomy, denotes either the thumb or great toe, according as either manus or pedis is added to it.

POLLICEPS, a ſhell-fiſh of the multivalve-kind, with a long, thin, and fleſhy pedicle, ſmaller at the baſe, and largeſt at the top; on the ſummit of which ſtands the ſhelly covering of the body of the animal, which is called a triton: this covering is compoſed of a conſiderable number of ſhelly laminæ, of different ſhapes and ſizes; but altogether forming a triangular body, from the opening in the two ſides of which the creature thruſts out its arms. See plate CCXLVI. ord. 3. which repreſents the bluiſh polliceps, with the pedicle longer than the body: its fleſhy covering conſiſts of an uncertain number of laminæ, all of a pyramidal figure, and ſhut every exactly: the pedicle is of a browniſh-colour, and the ſhelly part is a mixed bluiſh, grey and white.

POLLING, among gardeners, the operation of ſpreading the worm-caſts all over the walks, by means of long aſh-poles; which is ſaid to be very beneficial to the graſs of the walks.

POLLUTION, in general, ſignifies defileſment, or the rendering a perſon or place unclean or unholy. For the jewiſh pollutions, ſee the article IMPURITY.

The romaniſts hold a church to be polluted by the effuſion of blood, or of ſeed therein; and require its being conſecrated anew. And the Indians are ſo ſuperſtitious on this head, that they break all the veſſels which thoſe of another religion have drank out of, or even only touched; and drain all the water out of a pond, in which a ſtranger has bathed.

POLLUTION, in medicine, a diſeaſe which conſiſts in an involuntary emiſſion of the ſeed in time of ſleep. This, in different perſons, is very different in degree; ſome being affected with it only once in a week, a fortnight, three weeks, or a month, and others being ſubject to it almoſt every night. The perſons moſt ſubject to it, are young men of a ſanguineous temperament, who feed high and lead a ſedentary life. When this happens to a perſon but once in a fortnight or a month, it is of no great conſequence; but when it happens almoſt every night, it greatly injures the health; the patient looks pale and ſickly: in ſome the eyes become weak and inflamed, are ſometimes affected with violent defluctions, and are uſually at laſt incircled with a livid appearance of the ſkin. This diſtemper is to be cured

rather

rather by a change of life than by medicines. When it has taken its riſe from high diet, and a ſedentary life, a coarſer food and the uſe of exerciſe, will generally cure it; but if any medicines are to be given, nitre alone will do more than almoſt all the reſt. This may be taken in large doſes, a ſcruple at a time, with very little liquid with it, and muſt be continued for ſome time at night going to reſt. The root of the water-lily, is greatly recommended by ſome in this caſe; and by others, the ſeeds of the agnus-caſtus; but it is very doubtful whether they have either of them any effect. Perſons ſubject to this diſeaſe, ſhould never take any ſtimulating purges, and muſt avoid as much as poſſible, all violent paſſions of the mind: and though exerciſe is recommended in moderation, yet if this be too violent, it will rather increaſe the diſorder, than contribute to its cure.

POLLUX, in aſtronomy, a fixed ſtar of the ſecond magnitude in the conſtellation gemini, or the twins.

The ſame name is alſo given to the hindermoſt twin, or poſterior part of the ſame conſtellation.

POLOCZK, the capital of the palatinate of the ſame name, in the dutchy of Lithuania, in Poland: eaſt long. 29°, north lat. 56° 30′.

POLVERINE, in commerce, the aſhes of the herb kali, preſerved for the uſe of making glaſs. See GLASS and KALI.

POLYACANTHA, in botany, the ſame with the carduus, or thiſtle. See the article CARDUUS.

POLYADELPHIA, in botany, a claſs of plants, the eighteenth in order, whoſe ſtamina are connected together at their baſes into ſeveral ſerieſes.

The plants of this claſs, are ſubdivided into orders according to the number of their ſtamina: thus the polyadelphia pentandria, contain five ſtamina; and the polyadelphia icoſandria and polyandria, contain twenty or more ſtamina.

POLYANDRIA, in botany, a claſs of plants, the thirteenth in order, with hermaphrodite flowers, and a large number of ſtamina, or male parts in each; theſe always exceed the number of twelve, and grow on the receptacle of the future ſeeds. The genera of this claſs being numerous, are arranged under different orders; the firſt of which is called polyandria monogynia, as containing only one ſtyle; the ſecond, polyandria digynia, as having two ſtyles; and ſo of the polyandria trigynia, tetragynia, pentagynia, &c. from their containing three, four, five, &c. ſtyles.

POLYANTHEA, a collection of common places, in alphabetical order; for the uſe of orators, preachers, &c. See the article BOOK.

POLYANTHUS, in botany, a garden-flower of the primroſe kind. The word is alſo uſed to denote any plant, which produces many flowers. See the article PRIMULA VERIS.

POLYCHREST, in pharmacy, a medicine that ſerves for many uſes, or that cures many diſeaſes.

Sal POLYCHREST, a compound ſalt made of equal parts of ſalt-petre and ſulphur, laid on a red-hot crucible.

POLYCNEMUM, in botany, a genus of the triandria monogynia claſs of plants, the flower of which is compoſed of five petals, very like the leaves of the cup but ſhorter: the ſeed, which follows each flower, is ſingle; and has ſcarce any covering, or at moſt only a very thin membrane.

POLYGALA, MILKWORT, in botany, a genus of the diadelphia decandria claſs of plants, with a papilionaceous flower: the fruit is a turbinato-cordated capſule.

A decoction of this plant, leaves and root together, being drank by nurſes, is ſaid to increaſe their milk; whence the name.

POLYGAMIA, in botany, a claſs of plants, the twenty-third in order, the characters of which are, that they have flowers of different ſtructure; ſome having male-flowers, others female ones, and others hermaphrodite.

Of this claſs there are two orders, or ſubdiviſions; whereof the firſt comprehends ſuch polygamious plants, as contain the different kinds of flowers, on different parts of the ſame plant; and hence called polygamia monoecia: ſuch are the muſa, veratrum, celtis, parietaria, &c. The ſecond order conſiſts of ſuch polygamious plants, as have their different flowers, not on the ſame individual plant, but on different plants of the ſame ſpecies: ſuch are the chamærops, fraxinus, rhodiola, &c.

POLYGAMY, a plurality of wives or huſbands, in the poſſeſſion of one man or woman, at the ſame time.

Many arguments have been offered to prove the unlawfulneſs of polygamy, or

one of the principal of which is, that the males and females brought into the world, are nearly on a ballance; only abating for a ſmall exceſs on the ſide of the males, to make up for the extraordinary expence thereof, in war and at ſea: whence it evidently follows, that nature only intends one wife, or one huſband, for the ſame perſon: ſince if they have more, ſome muſt go without any at all. Hence it is juſtly concluded, that the chriſtian-law, which prohibits polygamy, is more agreeable to the law of nature than the mahometan, and we may add, than the jewiſh law, by which polygamy was tolerated. Yet Selden, in his Uxor Ebraica, ſays, that a plurality of wives was allowed of not only among the Hebrews, but among all other nations. The antient Romans, it is true, were more ſevere in their morals, and never practiſed it, though it was not forbidden among them; and Mark Anthony is mentioned as the firſt, who took the liberty of having two wives: but from that time, it became pretty frequent in the empire, till the reigns of Theodoſius, Honorius, and Arcadius, who firſt prohibited it in the year 393, by an expreſs law. After this, the emperor Valentinian by an edict, allowed all the ſubjects of the empire, the liberty of marrying ſeveral wives: and it does not appear from the hiſtory of thoſe times, that the biſhops made any oppoſition to this introduction of polygamy.

By the laws of England, polygamy is made felony, except in the caſe of abſence beyond the ſeas for ſeven years; and where the abſent perſon is living in England, Wales, or Scotland, and the other party has notice of it, ſuch marrying is felony by the ſtatute 1 Jac. I. c. 11.

POLYGLOTT, πολυγλοττος, among divines and critics, chiefly denotes a bible printed in ſeveral languages. In theſe editions of the holy ſcriptures, the text in each language is ranged in oppoſite columns. The firſt polyglott bible, was that of cardinal Ximenes printed in 1517, which contains the hebrew text, the chaldee paraphraſe on the pentateuch, the greek verſion of the LXX. and the antient latin verſion. After this, there were many others, as the bible of Juſtiniani, biſhop of Nebio, in hebrew, chaldee, greek, latin, and arabic; the pſalter by John Potken, in hebrew, greek, ethiopic, and latin; Plantin's polyglott bible, in hebrew, chaldee, greek, and latin, with the ſyriac verſion of the new teſtament; M. le Jay's bible in hebrew, ſamaritan, chaldee, greek, ſyriac, latin, and arabic; Walton's polyglott, which is a new edition of Le Jay's polyglott, more correct, extenſive, and perfect, with ſeveral new oriental verſions, and a large collection of various readings, &c.

POLYGON, in geometry, a figure with many ſides, or whoſe perimeter conſiſts of more than four ſides at leaſt: ſuch are the pentagon, hexagon, heptagon, &c. See PENTAGON, HEXAGON, &c.

Every polygon may be divided into as many triangles, as it has ſides: for if you aſſume a point, as *a*, pl. CCVII. fig. 2. n° 1, any where within the polygon, and from thence draw lines to every angle *a b*, *a c*, *a d*, &c. they ſhall make as many triangles as the figure has ſides. Thus, if the polygon hath ſix ſides (as in the figure above) the double of that is twelve, from whence take four, and there remains eight: I ſay that all the angles *b*, *c*, *d*, *e*, *f*, *g*, of that polygon, taken together, are equal to eight right angles. For the polygon, having ſix ſides, is divided into ſix triangles; and the three angles of each by 1. 32 Eucl. are equal to two right ones; ſo that all the angles together make twelve right ones: but each of theſe triangles hath one angle in the point *a*, and by it they complete the ſpace round the ſame point; and all the angles about a point are known to be equal to four right ones, wherefore thoſe four taken from twelve, leave eight the ſum of the right angles of the hexagon.

So it is plain the figure hath twice as many right angles, as it hath ſides, except four. *Q. E. D.*

Every polygon circumſcribed about a circle, is equal to a rectangled-triangle, one of whoſe legs ſhall be the radius of the circle, and the other the perimeter (or ſum of all the ſides) of the polygon. Hence every regular polygon is equal to a rectangled-triangle, one of whoſe legs is the perimeter of the polygon, and the other a perpendicular drawn from the center to one of the ſides of the polygon. And every polygon circumſcribed about a circle is bigger than it; and every polygon inſcribed is leſs than the circle, as is manifeſt, becauſe the thing containing

is always greater than the thing contained. The perimeter of every polygon circumſcribed about a circle is greater than the circumference of that circle, and the perimeter of every polygon inſcribed is leſs. Hence a circle is equal to a right-angled triangle, whoſe baſe is the circumference of the circle, and its height the radius of it.

For this triangle will be leſs than any polygon circumſcribed, and greater than any inſcribed; becauſe the circumference of the circle, which is the baſe of the triangle, is greater than the compaſs of any inſcribed, therefore it will be equal to the circle. For, if this triangle be greater than any thing that is leſs than the circle, and leſs than any thing that is greater than the circle, it follows that it muſt be equal to the circle. This is called the quadrature or ſquaring of the circle; that is, to find a right-lined figure equal to a circle, upon a ſuppoſition that the baſis given is equal to the circumference of the circle: but actually to find a right line equal to the circumference of a circle is not yet diſcovered geometrically. See the article CIRCLE.

Problems concerning POLYGONS. 1. On a regular polygon to circumſcribe a circle, or to circumſcribe a regular polygon upon a circle: biſſect two of the angles of the given polygon A and B (*ibid.* n° 2.) by the right lines A F, B F; and on the point F, where they meet, with the radius A F, deſcribe a circle, which will circumſcribe the polygon. Next to circumſcribe a polygon, divide 360 by the number of ſides required, to find *e* F *d*; which ſet off from the center F, and draw the line *de*, on which conſtruct the polygon as in the following problem. 2. On a given line to deſcribe any given regular polygon: find the angle of the polygon in the table, and in E ſet off an angle equal thereto; then drawing E A=E D, through the points E, A, D, deſcribe a circle, and in this applying the given right line as often as you can, the polygon will be deſcribed. 3. To find the ſum of all the angles in any given regular polygon: multiply the number of ſides by 180°; from the product ſubſtract 360°, and the remainder is the ſum required: thus, in a pentagon, 180×5 =900, and 900—360=540 the ſum of all the angles in a pentagon. 4. To find the area of a regular polygon: multiply one ſide of the polygon by half the number of ſides; and then multiply this product by a perpendicular, let fall from the center of the circumſcribing circle, and the product will be the area required: thus, if A B (the ſide of a pentagon) =54×2½=135, and 135×29 (the perpendicular) =3915=the area required. 5. To find the area of an irregular polygon, let it be reſolved into triangles, and the ſum of the areas of theſe will be the area of the polygon. See TRIANGLE, INSCRIBED, &c.

POLYGON, in fortification, denotes the figure of a town, or other fortreſs. See the article FORTIFICATION.

The exterior or external polygon is bounded by lines drawn from the point of each baſtion, to the points of the adjacent baſtions. See BASTION.

And the interior polygon, is formed by lines joining the centers of the baſtions.

Line of Polygons, on the french ſectors, is a line containing the homologous ſides of the firſt nine regular polygons inſcribed in the ſame circle; that is, from an equilateral triangle, to a dodecagon.

POLYGONAL NUMBERS, are ſo called, becauſe the units whereof they conſiſt may be diſpoſed in ſuch a manner, as to repreſent ſeveral regular polygons. See the article NUMBER.

The ſide of a polygonal number is the number of terms of the arithmetical progreſſion that compoſe it; and the number of angles is that which ſhews how many angles that figure has, whence the pylygonal number takes its name.

To find a polygonal number, the ſide and number of its angles being given, the canon is this: the polygonal number is the ſemi-difference of the factums of the ſquare of the ſide into the number of angles diminiſhed by two units, and of the ſide itſelf into the number of angles diminiſhed by four units.

The ſums of polygonal numbers collected in the ſame manner as the polygonal numbers themſelves are, out of arithmetical progreſſions, are called pyramidal numbers.

POLYGONATUM, SOLOMON'S SEAL, in botany, is ranked by Linnæus among the convallaria. See CONVALLARIA.

The root of this plant is a famous vulnerary; for being applied in form of a poultice, it not only heals freſh wounds, but takes away the marks of bruiſes, &c.

POLYGONUM, BISTORT. See the article BISTORT.

POLYGYNIA, among botaniſts, denotes an order or ſubdiviſion of a claſs of plants;

plants; comprehending ſuch plants of that claſs, as have a great number of piſtils, or female organs of generation. See PISTIL and GENERATION.

POLYHEDRON, in geometry, denotes a body or ſolid comprehended under many ſides, or planes. See SOLID.

A gnomonic polyhedron is a ſtone with ſeveral faces, whereon are deſcribed various kinds of dials. See DIAL.

POLYHEDRON, POLYSCOPE, in optics, is a multiplying glaſs or lens, conſiſting of ſeveral plane ſurfaces diſpoſed into a convex form. See the article LENS.

The phænomena of the polyhedron are as follow: 1. If ſeveral rays, as E F, A B, C D (plate CCVII. fig. 3. n° 1.) fall parallel on the ſurface of a polyhedron, they will continue parallel after refraction.

If then the polyhedron be ſuppoſed regular, L H, H I, I M, will be as tangents, cutting the ſpherical convex lens in F, B, and D; conſequently, rays falling on the points of contact interſect the axis. Wherefore, ſince the reſt are parallel to theſe, they alſo will mutually interſect each other in G.

Hence, if the eye be placed where parallel rays decuſſate, rays of the ſame object will be propagated to it ſtill parallel from the ſeveral ſides of the glaſs. Wherefore, ſince the cryſtalline humour, by its convexity, unites parallel rays, the rays will be united in as many different points of the retina, *a*, *b*, *c*, as the glaſs has ſides.

Conſequently, the eye, through a polyhedron, ſees the object repeated as many times as there are ſides: and hence, ſince rays coming from remote objects are parallel, a remote object is ſeen as often repeated through a polyhedron, as that has ſides. 2. If rays, A B, A C, A D, *ibid.* n° 2. proceeding from a radiant point A, fall on ſeveral ſides of a regular polyhedron; after refraction they will decuſſate in G, and proceed on a little diverging.

Hence, if the eye be placed where the rays coming from the ſeveral planes decuſſate, the rays will be propagated to it from the ſeveral planes a little diverging, i. e. as if they proceeded from different points. But ſince the cryſtalline humour, by its convexity, collects rays from ſeveral points into the ſame point; the rays will be united in as many different points of the retina, *a*, *b*, *c*, as the glaſs has ſides; conſequently, the eye, being placed in the focus G, will ſee even a near object repeated as often through the polyhedron, as that has ſides. Thus may the images of objects be multiplied in a camera obſcura, by placing a polyhedron at its aperture, and adding a convex lens at a due diſtance therefrom. And it really makes a very pleaſant appearance, if a priſm be applied ſo as the coloured rays of the ſun refracted therefrom be received on the polyhedron: for by this means they will be thrown on a paper or wall near at hand in little lucid ſpecks, much exceeding the brightneſs of any precious ſtone; and in the focus of the polyhedron, where the rays decuſſate (for in this experiment they are received on the convex ſide) will be a ſtar of ſurpriſing luſtre.

If images be painted in water-colours in the areolæ or little ſquares of a polyhedron, and the glaſs applied to the aperture of a camera obſcura; the ſun's rays, paſſing through it, will carry with them the images thereof, and project them on the oppoſite wall. This artifice bears a reſemblance to that other, whereby an image on paper is projected on the camera, *viz.* by wetting the paper with oil, and ſtraining it tight on a frame; then applying it to the aperture of the camera obſcura, ſo as the rays of a candle may paſs through it upon the polyhedron.

POLYHISTOR, a perſon of great and various erudition; whence

POLYMATHY, πολυμαθια, denotes the knowledge of many arts and ſciences.

POLYMNIA, in botany, a genus of the ſyngeneſia polygamia neceſſaria claſs of plants, the common calyx of which is a roundiſh perianthium, conſiſting of ten leaves; the compound flower is convex, with five female floſcules in the radius; there is no pericarpium; the cup remains unchanged, the ſeed is ſingle, oval, gibbous and naked.

POLYMYTHY, πολυμυθια, in poetry, a fault in an epic poem, when inſtead of a ſingle mythos, or fable, there is a multiplicity of them.

POLYNOMIAL, or MULTINOMIAL, in algebra. See MULTINOMIAL.

POLYOPTRUM, in optics, a glaſs thro' which objects appear multiplied, but diminiſhed.

POLYPE, or POLYPUS, in zoology, a ſmall freſh-water inſect of a cylindric figure, but variable, with very long tentacula.

There is ſcarce an animal in the world more difficult to deſcribe than this ſurpriſing

priſing inſect; it varies its whole figure at pleaſure, and is frequently found beſet with young in ſuch a manner, as to appear ramoſe and divaricated; theſe young ones adhering to it in ſuch a manner as to appear parts of its body.

When ſimple and in a moderate ſtate as to contraction or dilatation, it is oblong, ſlender, pellucid, and of a pale-reddiſh colour: its body is ſomewhat ſmaller towards the tail, by which it affixes itſelf to ſome ſolid body; and larger towards the other extremity, where it has a large opening, which is the mouth, around which are the tentacula, which are eight in number, and one uſually extended to about half the length of its body. By means of its tentacula, or arms, as they are commonly called, expanded into a circle of more than half a foot diameter, the creature feels every thing that can ſerve it for food; and ſeizing the prey with one of them, calls in the aſſiſtance of the others, if neceſſary, to conduct it to its mouth.

The production of its young is different from the common courſe of nature in other animals; for the young one iſſues from the ſide of its parent in the form of a ſmall pimple, which lengthening every hour, becomes, in about two days, a perfect animal, and drops from off its parent to ſhift for itſelf: but before it does this, it has often another growing from its ſide; and ſometimes a third from it, even before the firſt is ſeparated from its parent; and what is very extraordinary is, that there has never yet been diſcovered among them any diſtinction of ſex, or appearance of copulation; every individual of the whole ſpecies being prolific, and that as much if kept ſeparate, as if ſuffered to live among others: but what is even ſtill more ſurpriſing, is the reproduction of its ſeveral parts when cut off; for when cut into a number of ſeparate pieces, it becomes in a day or two ſo many diſtinct and ſeparate animals; each piece having the property of producing a head and tail, and the other organs neceſſary for life, and all the animal functions. There are ſeveral other ſpecies of this animal, moſt of which are found in our ditches. See plate CCVII. fig. 4. where n° 1. repreſents a cluſter-polype, extending itſelf; and n° 2. is the ſame polype after being ſoaked in water, and the tentacula, or branches, laid ſtraight.

Mr. Ellis endeavours to prove, that corallines, and other marine productions of the like kind, are only caſes or coverings for marine polypes. See the article CORALLINE.

POLYPETALOUS, among botaniſts, an epithet applied to ſuch flowers as conſiſt of ſeveral petals, or flower-leaves. See the article FLOWER.

POLYPODIUM, POLYPODY, in botany, a genus of moſſes, the fructifications of which are diſpoſed in round ſpots on the under ſide of the diſk of the leaf.

The polypodies are not branched, but conſiſt of ſingle leaves, divided almoſt to the middle rib into oblong jaggs, or ſegments. Both the root and leaves are uſed in medicine, being a gentle cathartic, and recommended in obſtructions of the viſcera.

POLYPREMUM, in botany, a genus of the tetrandria-monogynia claſs of plants, the calyx of which is a four-leafed, permanent, perianthium; the leaves are ſpear-ſhaped, keel-ſhaped, and coloured on the inſide; the corolla conſiſts of a ſingle rotated petal, the fruit is an oval capſule, emarginated, compreſſed at the top, divided into two valves, and containing two cells, in which are a great many ſeeds.

POLYPUS, or POLYPUS *of the heart*, in medicine, a maſs compoſed of various pellicles and fibres generated in the heart and large veſſels.

Polypuſes are generally found in acute as well as chronic diſeaſes. Their principal ſeat is in the heart, pulmonary artery, and the aorta. They chiefly attack the ſanguine conſtitutions, and ſuch as have ſmall veſſels and ſoft fibres; thoſe who are of a ſedentary life, who drink little, or are free in the uſe of acid wines and ſpirituous liquors, or who eat great ſuppers.

The beginning of a polypus may be known by a compreſſion of the breaſt, a fixed pain about the heart; and when it increaſes, there is a frequent palpitation of the heart, from very ſlight cauſes; the pulſe is ſtrangely unequal, and often intermits; on a violent motion of the body, or the patient's taking a medicine which diſturbs the blood, or on the mind's being violently affected, there ariſes a ſhortneſs of breath, and an incredible anxiety of the heart. Laſtly, there are frequent faintings, without any evident cauſe, or only from a certain poſition of the

the body; and if the blood is let fall into hot water, it will congeal like jelly, and cleave into white filaments.

A polypus frequently produces the moſt dreadful diſeaſes, and even ſudden death. In the cure, an exact regimen and diet muſt be made uſe of, with frequent exerciſe, and motions of the body. Etmuller ſays, that when it proceeds from the ſcurvy, or hyſteric affection, it is curable, and that the cure is to be attempted with chalybeate and coraline medicines, with cinnabar, volatiles, preparations of amber, and all antiſpaſmodics.

POLYPUSES *of the lungs*, are viſcous excretions of the ſmall glands, formed in the deeper branches of the aſpera arteria, and frequently miſtaken for pieces of the blood-veſſels or lungs.

POLYPUS *of the noſe*, a fleſhy excreſcence, in the inſide of the noſtrils, which is of various ſizes, and of different conſiſtencies; ſometimes theſe excreſcences are ſoft, ſometimes they are capable of elongation, and at other times they turn hard and rigid. In their beginning they are generally ſmall, and advance gradually; ſome are concealed within the noſe, and others hang out of that organ down to the lips, while others deſcend backwards through the apertures by which we draw the air through the noſtrils, and not only occaſion great difficulty in ſpeaking and ſwallowing, but ſometimes almoſt ſtrangle the patient. They are generally attended with pain; but ſome, which are hard and livid, are extremely painful. They have generally but one root; but ſometimes they have many.

Heiſter mentions a method of extirpating a polypus, by conveying a ligature round its baſis, and tying it faſt: but when the roots are inacceſſible, he adviſes taking hold of it with a crooked forceps, and twiſting it till the roots are broken. If the flux of blood is not conſiderable, the ſurgeon may ſuffer it to continue till it ceaſes of itſelf; but if it is profuſe and dangerous, it is to be ſtopped with doſſils dipt in ſtiptic liquors and powders, thruſt up the noſtrils. Mr. Le Dran cured a polypus of the noſe, which he could not extract wholly, in the following manner: he introduced one end of a large ſeton put on the point of the fore-finger of the left-hand into the patient's mouth, till he brought it behind the velum pendulum; then ſliding a pair of thin crooked forceps into the affected noſtrils, catched hold of the ſeton, after covering what was to be introduced into the noſe with a ſuppurant medicine. While he drew the cord, he endeavoured to preſerve the velum pendulum from being hurt, by introducing his fore-finger into the mouth, and ſupporting the cord upon it. He continued the ſuppurant till he was ſenſible by the patient's breathing freely through the noſtril, that the remains of the polypus were deſtroyed, and then he injected deſiccatives to cauterize the ulcer.

POLYPYRENEOUS, an appellation given to fruits, containing ſeveral kernels, or ſeeds.

POLYSCOPE, in optics, the ſame with polyhedron. See POLYHEDRON.

POLYSPASTON, in mechanics, a machine conſiſting of an aſſemblage of ſeveral pullies; for the nature and force of which, ſee the article PULLEY.

POLYSPERMOUS, among botaniſts, ſuch plants as have more ſeeds than four ſucceeding each flower, without any certain order.

POLYSYLLABLE, in grammar, a word conſiſting of more ſyllables than three; for when a word conſiſts of one, two, or three ſyllables, it is called a monoſyllable, diſſyllable, and triſyllable.

POLYSYNDETON, in grammar and rhetoric, a figure whereby a redundance of conjunctions, eſpecially copulative ones, is uſed; an example of which we have in the following verſe of Virgil.

Una eurufque notuſque ruunt, creberque procellis africus.

POLYTHEISM, in matters of religion, the doctrine or belief of a plurality of gods. See the article GOD.

POLYTRICHUM, in botany, a genus of moſſes, conſiſting of ſtalks furniſhed with leaves, and producing ſeparate pedicles ſupporting capſules; the pedicles always grow out of the extremities of the ſtalks; the calyptræ are hairy; and the leaves in ſome ſpecies are rigid, in others ſoft.

POMADA, the exerciſe of vaulting the wooden horſe, by laying one hand over the pommel of the ſaddle.

POMATUM, an ointment made thus: Take of freſh hog's lard, three pounds; of the apples commonly called pome-waters, pared and ſliced, one pound nine ounces; of the moſt fragrant roſe-water, ſix ounces; of florentine orrice-root, groſsly powdered, ſix drams: let all theſe boil together in balneo mariæ, till the apples are diſſolved; then ſtrain without expreſſion, and keep it for uſe.

Quincy

Quincy obſerves, that the apples are of no ſignificancy, and that the common pomatum is only lard beat into cream with roſe-water, and ſcented with oil of lemons, thyme, or the like. Pomatums are alſo occaſionally perfumed with the odours of jeſſamines, oranges, jonquils, tuberoſes, &c. They are principally uſed for pimples, and foulneſſes of the ſkin.

POMEGRANATE, *malus punica*, in commerce, the fruit of a plant called by botaniſts punica. See PUNICA.

This fruit does not much differ in its medicinal virtues from quinces, and is much ordered in decoctions againſt gonorrhœas and fluxes, and often in aſtringent clyſters; though it has but little ſhare in the ſhop-compoſitions. The juice, which is reckoned much leſs aſtringent than the fruit, is preſcribed in weakneſſes of the ſtomach and bowels, and removes nauſeas, vomitings, and fluxes: it is reckoned alſo a good cooler in ſome inflammatory fevers. Its uſe in the ſhops is chiefly in the ſyrup of mint.

Pomegranates on being imported, pay a duty of 7 s. $8\frac{40}{100}$ d. the thouſand; and draw back, on exportation, 6 s. 9 d.

POMEIS, in heraldry, are green roundles, ſo called by the engliſh heralds, who give diſtinct names to the different coloured roundles.

POMERANIA, a province of Upper Saxony, in the north of Germany; bounded by the Baltic-ſea, on the north; by Poland, on the eaſt; by another part of Poland and Brandenburg, on the ſouth; and by the dutchy of Mecklenburg, on the weſt.

POMIFEROUS, in botany, an appellation given to apple-bearing trees. See the article APPLE.

POMME', or POMMETTE', in heraldry, is a croſs with one or more balls or knobs at each of the ends.

POMMEL, or PUMMEL, in the manege, a piece of braſs, or other matter, at the top and in the middle of the ſaddle-bow.

POMMEL is alſo a round ball of ſilver, ſteel, or the like, fixed at the end of the guard, or graſp of a ſword, to ſerve, in ſome meaſure, as a counterpoiſe.

POMPHOLYX, in the materia medica, a ſemi metallic recrement, very nearly allied in its nature to tutty; being a kind of flowers of zinc or calamine, ſublimed higher than tutty, and carrying leſs of any metalline particles with it.

It is a white, light, and friable ſubſtance, found in thin cakes or cruſts, adhering to the domes of furnaces, and covers of large crucibles, in which braſs is made either from a mixture of copper and lapis calaminaris, or of copper and zinc: it is found concreted alſo on the iron-rods, with which the workmen ſtir the metal while melting.

The pompholyx, therefore, as it approaches to true flowers of zinc, or as it carries leſs of the copper in it, has all the deſiccative and abſtergent virtues of tutty, and is leſs acrimonious: it obtunds the ſharpneſs of the humours in any part; it is better than tutty in collyriums and unguents for the eyes, and is excellent in cleanſing and drying old ulcers: it has alſo been given in intermitting fevers; but as there are many better medicines for theſe caſes, it might be more proper to uſe them.

POMUM, APPLE. See APPLE.

POMUM ADAMI, ADAM'S APPLE. See the article ADAMI *pomum*.

POND, or FISH-POND. See FISH-POND.

POND-WEED, *potamogeton*, in botany. See the article POTAMOGETON.

Water POND WEED, a ſpecies of perſicaria. See the article PERSICARIA.

PONDESTURA, a town of Montferrat, in Italy, thirty-three miles eaſt of Turin.

PONDICHERRY, a town of India, on the Coromandel-coaſt, ſixty miles ſouth of Fort St. George: here the French have a factory, and a ſtrong fort to defend it.

PONE, in law, a writ whereby a cauſe depending in an inferior court, is removed into the king's bench, or common-pleas.

PONFERRADA, a city of Spain, thirty-eight miles ſouth-weſt of Leon.

PONIARD, a little pointed dagger, very ſharp edged: it is now little uſed, except among aſſaſſins.

PONS VAROLI, in anatomy, the upper part of a duct in the third ventricle of the brain. See the article BRAIN.

St. PONS, a town of Languedoc, twenty miles north of Narbonne.

PONTAFELLA, a town of Italy, twenty-five miles north of Friuli.

PONTAGE, a contribution towards the maintenance of bridges.

PONT A MOUSON, a town of Lorrain, fifteen miles north of Nancy.

PONT DE L'ARCHE, a town of Normandy, ten miles ſouth of Rouen.

PONT D' ESPRIT, a town of Languedoc, forty-three miles north of Arles.

PONTE-

PONTEDERIA, in botany, a genus of the hexandria-monogynia claſs of plants, the flower of which conſiſts of a ſingle bilabiated petal; and its fruit is a trilocular, carnoſe capſule, of a triangular figure, containing a great many roundiſh ſeeds.

PONTEFRACT, a borough-town, eighteen miles ſouth-weſt of York. It ſends two members to parliament.

PONTESTURA, a town of Montferrat, ſix miles weſt of Caſal.

PONTIFEX, PONTIF, or HIGH PRIEST, a perſon who has the ſuperintendance and direction of divine worſhip, as the offering of ſacrifice and other religious ſolemnities. The Romans had a college of pontifs, and over theſe a ſovereign pontif, or pontifex maximus, inſtituted by Numa, whoſe function it was to preſcribe the ceremonies each god was to be worſhipped withal, compoſe the rituals, direct the veſtals, and for a good while to perform the buſineſs of augury, till, on ſome ſuperſtitious occaſion, he was prohibited intermeddling therewith. The office of the college of pontifs was to aſſiſt the high prieſt in giving judgment in all cauſes relating to religion, inquiring into the lives and manners of the inferior prieſts, and puniſhing them if they ſaw occaſion, &c. The Jews too had their pontifs; and among the romaniſts, the pope is ſtill ſtyled the ſovereign pontif.

PONTIFICATE, is uſed for the ſtate or dignity of a pontif, or high prieſt; but more particularly in modern writers, for the reign of a pope.

PONTON, or PONTOON, in war, denotes a little floating bridge made of boats and planks. The ponton is a machine conſiſting of two veſſels, at a little diſtance, joined by beams, with planks laid acroſs for the paſſage of the cavalry, the cannon, infantry, &c. over a river, or an arm of the ſea, &c. The late invented ponton is of copper furniſhed with an anchor, &c. to fix it. To make a bridge, ſeveral of theſe are diſpoſed two yards aſunder, with beams acroſs them; and over thoſe are put boards or planks. They are alſo linked to each other and faſtened on each ſide the river by a rope run through a ring in each of their heads, and fixed to a tree or ſtake on either ſhore: the whole makes one firm uniform bridge, over which a train of artillery may paſs. See BRIDGE.

PONTUS, the antient name of the countries ſituated on the ſouth ſide of the Euxine-ſea, now a part of Aſiatic Turky.

PONT VOLANT, flying bridge. See the article BRIDGE.

POOL, is properly a reſervoir of water ſupplied with ſprings, and diſcharging the overplus by ſluices, defenders, weirs, and other cauſeways.

Mill-POOL, a ſtock of water by whoſe force, &c. the motion of a mill is effected. See the article MILL.

Whirl-POOL. See WHIRL-POOL.

POOL, in geography, a borough and port-town of Dorſetſhire, ſituated on a bay of the engliſh channel, twenty miles eaſt of Dorcheſter: it ſends two members to parliament.

POOLOWAY, one of the Banda or nutmeg-iſlands in the indian ocean: eaſt long. 128°, ſouth lat. 3° 30′.

POOP, *puppis*, the ſtern of a ſhip, or the higheſt, uppermoſt, and hinder part of the ſhip's hull. See the articles STERN and SHIP.

POOR, in law, an appellation given to all perſons who are in ſo low and mean a condition, as that they either are, or may become a burden to a pariſh.

Hence under the term poor, may be included thoſe who are ſo through impotency; as the aged, the blind, the lame, the fatherleſs and motherleſs, perſons labouring under ſickneſs, or who are idiots, lunatics, &c. for all whom the overſeers of the poor are obliged to provide.

There is alſo another kind of poor, on account of caſualties and misfortunes; as decayed houſe-keepers, and thoſe who have been ruined either by fire, water, robbery, or loſſes in trade, &c. all of whom, being able, are to be ſet to work, and otherwiſe relieved by the pariſh; and it is the ſame with reſpect to poor perſons overcharged with children, diſabled labourers, &c. As for vagabonds, ſtrumpets and other thriftleſs ſorts of poor, they may and ought to be ſent to houſes of correction, and put to hard labour, whereby they may be maintained: yet if even theſe fall ſick there, or their work is not ſufficient to maintain them, in that caſe there muſt be an allowance by the overſeers for their ſupport.

Before the reign of queen Elizabeth, we had few or no laws for the relief of the poor of this kingdom; but then a ſtatute was made enacting, that the church-

churchwardens of every parish, and two or more housholders are to be nominated and appointed yearly in easter week by two justices of the peace, as overseers of the poor; which said overseers shall meet once a month at the parish church, there to consider of proper ways to relieve the poor, &c. And with the assent of the justices they may make a rate on every inhabitant of the parish, and occupier of lands, houses, tithes; as also personal estate, to raise a stock for imploying of the poor, relieving the impotent, and others not able to work, the placing poor children out apprentices, and erecting cottages for poor persons, &c. The overseers are likewise to give a true account to two justices within four days after the end of the year, or forfeit twenty shillings, and where these officers are not appointed, the justices incur five pounds penalty. 43 Eliz. c. 2. By this statute the father or grandfather, and mother or grandmother, or even children of poor impotent persons, where they are of ability, are obliged to relieve such poor, according to such rates as justices of peace in their sessions shall appoint, under a penalty of twenty shillings a month for every failure therein. *Ibid.* It has been adjudged that a grandfather or father-in-law, that is married to the grandmother, or mother, is within this statute; and if the father of any children leaves the parish, and there is a grandfather to be found, in case he is able to do it, it is said he shall be chargeable with the keeping of the children, and not the parish where they are.

By a late act, the churchwardens and overseers of the poor, where a wife or child is left upon a parish, by persons who have estates or effects which might maintain them, on a warrant of two justices, may seize the goods and receive the rents of the husband or father, in order to support such wife or child. 5 Geo. 1. c. 8.

Every parish is generally to keep and maintain its own poor; and in case any poor persons demand relief, that are not parishioners, they ought to be removed to their proper parishes, and there be relieved; for that parish the poor were last legally settled at, is deemed the place that shall provide for them. And where persons are removed, by warrant or order of justices of peace, they shall be received by the churchwardens and overseers whither sent, on pain of forfeiting five pounds to the poor of the parish whence conveyed, to be levied by distress and sale of goods, &c. Nevertheless a sick person should not be sent out of the parish where he is, so as farther to indanger his health; in which case, if the justices grant a warrant to remove him, it will be a misdemeanor in such justices.

As to the settlement, which entitles poor persons to relief, it is acquired several ways, *viz.* on account of birth, in the case of bastards, vagrants, &c. by continuance of forty days in a parish, after public notice given to overseers, &c. or coming into a parish and renting ten pounds a year estate, or executing any public annual office, paying a share to the parish taxes, &c. Also servants acquire this title, by serving a year in any parish; and persons bound apprentices: and tho' a person be only a lodger, it is held that his servant may gain a settlement by serving a year in any parish.

The wife of a person is to be sent to, and settled with her husband, even tho' he should be only a servant; and as generally all children are to their parents. It is however provided, that poor persons shall have the liberty to go to any parish, by virtue of a certificate from churchwardens and overseers, attested by two witnesses, and subscribed by two justices of peace, owning them to be parishioners; and likewise agreeing, when they become chargeable, to receive them again.

It is also ordained, that there shall be kept in every parish a book, wherein the names of all such persons, as receive any relief, shall be registered, with the occasion thereof; and the parishioners are once a year, or oftener, to have a meeting for that purpose, when the said list shall be examined into, by calling over the persons, and inquiring into the reasons why they are relieved; and at this time a new list must be made of those thought fit to be allowed to receive collection; and the persons thus receiving relief, ought to wear badges on their right shoulders, also no others shall have any benefit, unless by order under the hand of one justice, &c. 3 & 4 W. & M. c. 11. And no justice of peace shall make any such order in behalf of any poor person, till oath is made of reasonable cause for it, and that he was refused

to be relieved by the overſeers, &c. And ſuch perſon ſhall be regiſtered in the pariſh books as other poor; nor may churchwardens and overſeers bring to the pariſh account any money given to poor perſons (except on ſudden and emergent occaſions) who are not regiſtered, on pain of five pounds. The churchwardens and overſeers of pariſhes are impowered to purchaſe or hire houſes, and contract with perſons, to maintain the poor, &c. who refuſing to be ſo kept, ſhall be ſtruck out of the pariſh books, &c. 9 Geo. 1. cap. 7. See 3 Geo. 2. c. 29.

For the manner of relieving poor priſoners, ſee the article PRISONER.

POOR, in ichthyology, a name given to the inch and a half gadus, with the anus in the middle of the body. See the article GADUS.

POPA MADRE, a town of Terra-Firma, in South America, ſituated on a high mountain, in weſt lon. 76°, north lat. 10° 15′.

POPAYAN, a province of South America, bounded by Terra-Firma, on the north; by New Granada, on the eaſt; by Peru, on the ſouth; and by the pacific ocean, on the weſt; ſituated between 75 and 80 degrees weſt longitude, and between the equator and 5 degrees of north latitude, being four hundred miles long, and about three hundred broad.

POPAYAN is alſo the capital of the province of Popayan, ſituated in weſt lon. 76°, north lat. 3°.

POPE, PAPA, the ſovereign pontiff, or ſupreme head of the romiſh church. The appellation of pope was antiently given to all chriſtian biſhops, but about the latter end of the eleventh century, in the pontificate of Gregory VII. it was uſurped by the biſhop of Rome, whoſe peculiar title it has ever ſince continued. The ſpiritual monarchy of Rome ſprung up ſoon after the declenſion of the roman empire. This ſovereign is addreſſed under the term holineſs, and in the council of the Lateran held under Innocent III. he was declared ordinary of ordinaries. The pope is an abſolute monarch in his italian dominions, and his power is very conſiderable; being able, in caſe of neceſſity, to put fifty thouſand men into the field, beſides his naval ſtrength in gallies. He is not only abſolute in his own dominions, but iſſues his orders in eccleſiaſtical affairs, called briefs and bulls, throughout the catholic world. See the articles CONSISTORY, BULL, and BRIEF.

The pope is choſen by the cardinals out of their own body. See the articles CARDINAL, and CONCLAVE.

POPE, POPA, in roman antiquities, the name of an inferior prieſt, or miniſter employed in the ſacrifices, whoſe office, it is ſaid, was to bring the victim to the altar, to tie it, and cut its throat. The popæ went half naked, the ſleeves of their garment being tied up, and the ſkirts ſhort and gathered about the waiſt, that they might not be incommoded in ſlaughtering the victim: while doing their office, they were always crowned with a laurel.

POPE'S TERRITORIES, in Italy, are bounded by the Venetian territories, on the north; by the gulph of Venice, on the north-eaſt; by Naples, on the ſouth-eaſt; by the Tuſcan ſea, on the ſouth-weſt; and by the dutchy of Tuſcany, on the north-weſt, almoſt encompaſſing that dutchy on the land ſide; being about two hundred and twenty miles long, and from twenty to one hundred and forty in breadth.

POPE, in ornithology, a ſpecies of alca, with four furrows on the beak, and with the ſides of the head white. See ALCA. This is a very ſingular bird, ſomewhat larger than the widgeon; the head is large, and rounded; the eyes are ſmall; the beak ſhort; the toes are three, placed forward, and connected by a firm membrane; and the wings are very ſhort, and compoſed of but few feathers, and not intended for high flights.

POPERINGEN, a town of the Auſtrian Netherlands, in the province of Flanders, ſituated five miles weſt of Ypres.

POPLAR, in botany. See POPULUS.

POPLES, in anatomy, the inner part of the juncture, whereby the thigh-bone is articulated with the tibia.

POPLITÆUS, in anatomy, a ſmall muſcle obliquely pyramidal, ſituated under the ham. It is fixed above by a ſtrong narrow tendon, to the outer edge of the condyle of the inner os femoris, and to the neighbouring poſterior ligament of the joint; from thence it runs obliquely downwards, under the inner condyle of the os femoris; its flat and pretty thick fleſhy body increaſing gradually in breadth, till it is fixed in the backſide of the head of the tibia, all the way to the oblique line obſervable on that ſide.

POPLITEA, in anatomy, a name given to the third vein of the leg, ariſing from

the heel, where it is formed out of ſeveral branches, coming both from the heel and ancle. It lies pretty deep in the fleſh, and aſcending up to the ham, terminates in the crural vein.

POPO, a territory of Guinea, in Africa, lying weſt of Whidah.

POPPY, *papaver*, in botany, a genus of the polyandria-monogynia claſs of plants, the corolla whereof conſiſts of four roundiſh, plane, patent, large petals, narroweſt at the baſe, and alternately ſmaller: the fruit is a capſule containing one cell, coronated with a large plane ſtigma, and opening with ſeveral foramina under it: the ſeeds are numerous and very ſmall: the receptacles are longitudinal plicæ, of the ſame number with the rays of the ſtigmata; they grow to the ſides of the fruit or capſule.

This is the plant which affords opium, for the virtues and preparations of which ſee the article OPIUM.

POPULAR, *popularis*, ſomething that relates to the common people.

POPULEUM, in pharmacy, an unguent prepared of the buds of black poplar, violet-leaves, navel-wort, and lard bruiſed and macerated; to which are added bramble-tops, leaves of black poppies, mandragora, henbane, night ſhade, lettuce and burdock boiled in roſe-water and ſtrained. It is much uſed as a cooler of burns, ſcalds, and all ſorts of inflammations, alſo to aſſwage arthritic pains.

POPULUS, the poplar, in botany, a genus of the dioecia-octandria claſs of plants, the corolla of which has no flower petals. The nectarium is monophyllous, turbinated, and tubulated below; oblique above, and terminating in an oval limb: the fruit is a roundiſh capſule, formed of two valves, and containing two cells, in each of which there is a number of roundiſh pappoſe ſeeds.

The buds of the poplar is uſed in the populeum, and the bark is detergent. The buds are alſo uſed by women in adorning and promoting the growth of their hair.

PORCAT, a port town of hither India, ſituated on the coaſt of Malabar, in eaſt long. 75° 30′, north lat. 9°.

PORCELAIN, or PURCELAIN, a fine ſort of earthen-ware, chiefly manufactured in China, and thence called china-ware. The moſt juſt idea we can form of the porcelain, or china-ware, is, that it is an half vitrified ſubſtance, or manufacture in a middle ſtate between the common baked earthen-ware of our vulgar manufactures, and true glaſs. This is the eſſential and diſtinctive character of porcelain, and it is only by conſidering it in this light, that we are to hope of arriving at the perfect art of imitating it in Europe. This attempt is to be made on theſe principles in two different manners: the one by finding ſome appropriated matter, on which fire acts with more than ordinary ſtrength, in the time of its paſſing from the common baked ſtate of earthen-ware into that of glaſs. The other is to compoſe a paſte of two ſubſtances, reduced to a powder, the one of which ſhall be of force to reſiſt a very violent fire, ſo as not to become vitrified in it; and the other a matter very eaſily vitrifiable. In the firſt caſe, the matter is to be taken out of the fire at the time when it is imperfectly vitrified, and in the other, the compound maſs is to remain in the furnace, till the one ſubſtance which is the more eaſily vitrifiable is truly vitrified; and being then taken out, the whole will be what porcelain is, a ſubſtance in part vitrified, but not wholly ſo. The firſt method is that by which the european porcelain has been generally made, which though it may be very beautiful, yet it is always eaſy to diſtinguiſh even the fineſt of it from the china-ware; and the nature of the two ſubſtances appears evidently different; theſe, owing all their beauty to their near approach to vitrification, are made to endure a long and violent fire, and are taken from it at a time when a little longer continuance ſhould have made them perfect glaſs: on the contrary, the china-ware being made of a paſte, part of which is made of a ſubſtance in itſelf ſcarce poſſible to be vitrified, bears the fire in a yet much more intenſe degree than ours, and is in no danger of running wholly into glaſs from it.

The two ſubſtances uſed by the Chineſe, are well known by the names of petunſe and kaolin; and on examining theſe, it appears very evident, that we have in Europe the very ſame ſubſtances, or at leaſt ſubſtances of the very ſame nature, capable of being wrought into porcelain equally beautiful and fine. See the articles KAOLIN and PETUNSE.

In making the chineſe porcelain, the firſt preparation of the petunſe, is by breaking and reducing it into powder, rendered almoſt impalpable by mallets, mor-

tars

tars and mills; which, being thrown into a large urn full of water, they ſtir briſkly about with an iron inſtrument. After the water has reſted a little while, they ſkim off from the top a white ſubſtance formed there, and diſpoſe it in another veſſel of water: they then ſtir again the water of the firſt urn, and again ſkim it, and thus alternately till there remains nothing but the gravel of the petunſes at bottom, which they lay afreſh into the mill for a new powder. As to the ſecond urn, wherein are put the ſkimming of the firſt, when the water is well ſettled and become quite clear, they pour it off, and with the ſediment collected at bottom in form of a paſte, fill a kind of moulds, whence, when almoſt dry, they take it out, and cut it into ſquare pieces, which are what they properly call ſquare petunſes; reſerving them to be mixed with the kaolin in the proportion hereafter aſſigned. The preparation of the kaolin is the ſame with that of the petunſes. Beſides theſe two kinds of earths, there are as many kinds of oils, or varniſhes, uſed in the compoſition of china-ware. The manner of preparing the firſt oil is this: the petunſes being waſhed, undergo the ſame operation as for making the ſquares, excepting that the matter of the ſecond urn is not put in moulds, but the fineſt part of it taken to compoſe the oil. To an hundred pounds of this matter they caſt a mineral ſtone, called ſhekau; this ſtone is firſt heated red hot, and thus reduced in a mortar to an impalpable powder, and ſerves to give the oil a conſiſtence, which however is ſtill to be kept liquid. The oil of lime makes the fourth ingredient: the preparation whereof is more tedious and circumſtantial. They firſt diſſolve quicklime, and reduce it to a powder, by ſprinkling water on it: on this powder they lay a couch of dry fern, and on the fern another of ſlacked lime, and thus alternately till they have got a moderate pile; which done, they ſet fire to the fern; the whole being conſumed, they divide the aſhes that remain on new couches of dry fern, ſetting them on fire as before; and this they repeat five or ſix times ſucceſſively, or even more: the oil being ſtill the better as the aſhes are oftener burnt. A quantity of theſe aſhes of fern and lime are now thrown into an urn full of water, and to an hundred pounds of aſhes is added a pound of ſhekau, which diſſolves therein. The reſt being performed, after the ſame manner as in preparing the earth of the petunſes; the ſediment found at the bottom of the ſecond urn, and which is to be kept liquid, is what they call the oil of lime, and which gives the porcelain all its luſtre.

In forming veſſels of PORCELAIN, the firſt thing is to purify the petunſe and kaolin, which for the firſt, is done after the manner already deſcribed in preparing the ſquares; for the ſecond it is ſufficient to plunge it in an urn of water, in an open baſket, as it will eaſily diſſolve. The dregs that remain are perfectly uſeleſs, and are emptied out of the work-houſe when a quantity is got together.

To make a juſt mixture of petunſe and kaolin, regard muſt be had to the fineneſs of the porcelain to be made: for the finer porcelain they uſe equal quantities; four parts of kaolin to ſix of petunſe for moderate ones; and never leſs than one of kaolin to three of petunſe for the coarſeſt. The hardeſt part of the work is the kneading and tewing the two earths together, which is done till the maſs be well mixed, and grow hard, by the workmen trampling it continually with their feet. Then being taken out of the baſons or pits wherein it is kneaded, it is done over a ſecond time, but piecemeal, and with the hands, on large ſlates for that purpoſe; and on this preparation it is, that the perfection of the work depends: the leaſt heterogeneous body remaining in the matter, or the leaſt vacuity that may be found in it, being enough to ſpoil the whole. The porcelain is faſhioned or formed either with the wheel like our earthen-ware, or in moulds. See the article POTTERY.

Smooth pieces as urns, cups, diſhes, *&c.* are made with the wheel; the reſt ſuch as are in relievo, as figures of men, animals, *&c.* are formed in moulds, but finiſhed with the chiſſel. The large pieces are made at two operations; one piece is raiſed with the wheel by three or four workmen, who hold it till it have acquired its proper figure; which done, they apply to it the other half, which has been formed in the ſame manner, uniting the two with porcelain earth made liquid by adding water to it; and poliſhing the juncture with a kind of iron-ſpatula. After the ſame manner it is that they join the ſeveral pieces of porcelain formed in moulds, or by the hand,

and that they add handles, *&c.* to the cups, and other works formed by the wheel.

The moulds are made after the ſame manner with thoſe of our ſculptors, *viz.* of divers pieces which ſeverally give their reſpective figure to the ſeveral parts of the model to be repreſented, and which are afterwards united to form a mould for an intire figure. The earth they are made of is yellow, and fat. It is kneaded like potters-earth, and when ſufficiently mellow, fine, and moderately dry, beating it ſtoutly, they form it into moulds, according to the works required, either by hand, or on the wheel. See MOULD.

All the works that are made in moulds are finiſhed by the hands with ſeveral inſtruments proper to dig, ſmooth, poliſh, and to touch up the ſtrokes that eſcape the mould, ſo that it is rather a work of ſculpture than of pottery. There are ſome works whereon relievos are added, ready made, as dragons, flowers, *&c.* others that have an impreſſion in creux, which laſt are engraved with a kind of puncheons. In general all porcelain-works are to be ſheltered from the cold; their natural humidity making them liable to break when they dry unequally.

In the painting of PORCELAIN, it is obſerved, that the chineſe painters, eſpecially thoſe that meddle with human figures, are all ſorry workmen; but it is otherwiſe with the colours they uſe, which are ſo exceeding lively and brilliant, that there are little hopes our workmen will ever come to vie with them. The painting-work is diſtributed among a great number of workmen in the ſame laboratory; to one it belongs to form the coloured circle about the edges of the porcelain; another traces out flowers, which another paints; this is for waters and mountains alone; that for birds, and other animals; and a third for human figures.

There are porcelains made of all colours, both with regard to the grounds, and to the repreſentations thereon. As to the colour of landſcapes, *&c.* ſome are ſimple, ſuch are all blues; others are mixed up with ſeveral tints; and others again are heightened with gold. The blue is made of lapis lazuli, prepared by burning it the ſpace of twenty-four hours in a kiln, where it is buried up in gravel to the height of half a foot: when burnt, they reduce it into an impalpable powder in porcelain-mortars, not varniſhed, and with peſtles of the ſame matter. For the red they uſe copperas; a pound of this they put in a covered crucible, in the lid whereof is left a little aperture through which the matter on occaſion may be ſeen. The crucible is heated with a reverberatory fire, till the black ſmoke ceaſes to aſcend, and a fine one ſucceeds it. A pound of copperas yields four ounces of red matter, which is found at the bottom of the crucible; though the fineſt part is that uſually adhering to the lid and ſides of the crucible. The powder of flints is likewiſe an ingredient in moſt of the other colours, *e.g.* for green, to three ounces of ſcoria of beaten copper, they uſe half an ounce of powder of flint, and an ounce of ceruſe. Violet is made by adding a doſe of white to the green already prepared; the more green is added the deeper is the violet. For yellow they uſe ſeven drachms of white, and three of the copperas-red. Moſt of theſe colours are covered up with gum-water, for application, with little ſalt-petre; ſometimes ceruſe or copperas, but more uſually copperas alone, being firſt diſſolved in the water. Indeed for porcelains that are to be quite red, the colour is uſually applied with oil, *i. e.* with the common oil of the porcelain; or another made of the white flints. There is another kind of red called blown red, becauſe in reality applied by blowing with a pipe, one of whoſe orifices is covered with a very fine gauze: the bottom of this tube is lightly applied to the colour wherewith the gauze is ſmeared, when blowing againſt the porcelain it becomes all ſprinkled over with little points. Black porcelain has likewiſe its beauty: this colour has a leady caſt, and is uſually heightened with gold. It is made of three ounces of lapis lazuli, with ſeven of the common oil of ſtone, though that proportion is varied as the colour is deſigned to be more or leſs deep. The black is not given to the porcelain till it be dry, nor muſt the work be put to the fire, till the colour be dry. The gold is not applied till after baking, and is rebaked in an oven for the purpoſe. To apply gold they break and diſſolve it in water, at the bottom of a veſſel of porcelain, till a thin gilded cloud ariſes on the ſurface; it is uſed with gum-water; and to give it a body they add three parts of ceruſe or thirty of gold. There is likewiſe a kind of marbled porcelain, which is not made by applying the marblings with the

the pencil, but for oil to varniſh it withal; uſing that of white flints, which hatches and cuts the work with a thouſand humorous ſtrokes, in manner of moſaic work. The colour this oil gives it is a white, ſomewhat aſhy. There are ſeveral other kinds of porcelain, but they are ſuch as are rather for curioſity than uſe.

The ſeveral kinds of porcelains being quite painted, with their ſeveral colours, and all the colours dry, are to be poliſhed, to prepare them to receive the oil, or varniſh, which is done with a pencil of very fine feathers, moiſtened with water, and paſſing lightly over to take off even the ſmalleſt inequalities. The oiling or varniſhing is the laſt preparation of the porcelain, before it is carried to the oven: this is applied more or leſs thick, and ſeldomer or oftener repeated, according to the quality of the work: for thin fine porcelain, they give two very thin couches; to others one; but that one equivalent to the other two: there is a great deal of art in applying the varniſh, both that it be done equally, and not in too great a quantity. The couches in the inſide are given by aſperſion, and thoſe on the outſide by immerſion. It muſt be obſerved, that the foot is not yet formed, but continues in a mere maſs, till the work has been varniſhed: it is at length finiſhed on the wheel, and when hollowed, a little circle is pointed in it, and ſometimes a chineſe letter. This painting being dry, the foot is varniſhed, and the work now carried to the oven to be baked.

In the baking or neal'ing of PORCELAIN, there are two kinds of ovens uſed; large ones for works that are only brought to the fire once; and ſmall ones for ſuch as require a double baking: the large ones are two chineſe fathoms deep, and almoſt four wide: they are formed of a mixture of three earths; the ſides and roofs are very thick; at the top of the dome, which is in form of a tunnel, is a large aperture to give vent to the flames and ſmoke; beſides which there are four or five ſmall ones around, which, by being opened and ſhut, ſerve to augment and diminiſh the heat. The hearth, which takes up the whole breadth of the oven, is placed in front againſt the opening of the door, and is two or three feet deep, and two broad; people paſſing over it on a plank to go into the furnace to range the porcelain. As ſoon as the fire is lighted, the door is walled up; only leaving an aperture for the conveyance of wood. Laſtly, the bottom of the oven is covered with ſand, wherein part of the firſt porcelain caſes are buried. The oven itſelf is uſually placed at the extremity of a long narrow veſtible, which ſerves inſtead of bellows; the air and wind being driven directly in the face of each oven.

Each piece of porcelain of any note, is diſpoſed in the furnace in its peculiar ſeparate caſe, but as to tea-diſhes, &c. the ſame caſe ſerves for ſeveral. The caſes are all of the ſame matter with the oven, they have no lids, but ſerve each other mutually; the bottom of a ſecond caſe fitting into the aperture of the firſt, and thus ſucceſſively to the top of each column. Each caſe, which is uſually of a cylindrical form, that the fire may communicate itſelf more equably to the porcelains incloſed, has at bottom a little lay of fine ſand covered over with duſt of kaolin, that the ſand may not ſtick to the work; and care is taken that the porcelain may not touch the ſides of the caſe. In the larger caſes, which hold the ſmall pieces, they have the middle vacant, in regard porcelains placed there would want the neceſſary heat. Each of theſe little pieces is mounted on a ſmall maſſive of earth, of the thickneſs of two crowns, covered with the powder of kaolin.

As faſt as the caſes are filled, a workman ranges them in the cavity of the furnace; forming them into piles, or columns, whereof thoſe in the middle are at leaſt ſeven foot high; the two caſes at the bottom of each column are left empty, as in the uppermoſt, as the fire has the leaſt effect on them. In this manner is the whole cavity of the oven filled with columns; excepting that part preciſely under the grand aperture. In ranging the caſes, they obſerve to place the fineſt piles of porcelain in the center; the coarſeſt at the bottom; and thoſe that are high coloured, and conſiſt of as much petunſe as kaolin, and wherein the worſt oil is uſed, at the mouth. Theſe piles are all placed very near one another, and are bound together at top, at bottom, and in the middle, by pieces of earth, in ſuch a manner as that the flame may have a free paſſage among them, and inſinuate equally on all ſides. The oven muſt never be ſet altogether with new caſes, but half one,

half

half the other, the old ones at the tops and bottoms of the pile, and the new ones in the middle. When the oven is filled, they wall up the door, only leaving a little aperture for the throwing in of little pieces of wood, to keep up the fire: it is then heated by degrees, for the ſpace of a day and a night. To know when the porcelain is baked enough, they open one of the leſſer holes of the oven, and with a pair of tongs take off the lid of one of the piles; if the fire appears very briſk and clean, and the piles equally inflamed, eſpecially if the colours of the porcelains that are uncovered, dart forth a noble luſtre, the coction is ſufficient: they diſcontinue the fire, and wall up what remained of the door of the furnace. If the oven be only filled with ſmall porcelain, they take them out twelve or fifteen hours after the fire is extinct; if it be filled with larger, they defer opening it for two or three days.

The Chineſe make another kind of porcelain which they paint and bake twice; and for this ſecond baking, they have a kind of little ovens on purpoſe. Theſe ovens, when very ſmall, are made of iron, or otherwiſe of a kind of bricks, made of the ſame earth with the porcelain caſes: the largeſt of theſe ovens does not exceed five foot in heigth, and three in diameter; and being much in the form of bee-hives, the bricks are arched a little to form the cavity the better. The porcelains here are not incloſed in caſes, as in the common ovens; the oven itſelf ſerving for that purpoſe, and being ſo exactly cloſed, that they receive no other impreſſions of the fire, but that of the heat of the charcoal, diſpoſed in the hearth at the bottom of the oven, as well as at top of the vault; and in the interval between the oven and the ſhell, or brick-wall. To prepare the porcelain for a ſecond baking, they muſt have had their varniſh in the common manner, and have paſſed the great oven: in this ſtate they are painted with various colours, after which, without giving them any new varniſh, they are ranged in piles in the little oven, ſetting the little ones over the larger, in form of pyramids. This ſecond baking is ſometimes intended to preſerve the luſtre of the colours the better, and at the ſame time to give them a kind of relievo; but more uſually its deſign is to hide defective places, by covering them over with colours: tho' the artifice is eaſily found out by paſſing the hand over them. When the workman judges his porcelain enough baked, he takes off the piece that covers the aperture, and if the works appear glittering, and the colours glowing, he takes out the charcoal; and when the oven is cold, the porcelain is ſo too.

The Saxons have now carried this manufacture the greateſt length of any other nation in Europe. Mr. Hanway tells us that, in order to preſerve this art as much as poſſible a ſecret among themſelves, the fabric at Meiſſen is rendered impenetrable to any but thoſe who are immediately employed about the work; and that the ſecret of mixing and preparing the materials is known to a very few of them, who are all confined as priſoners, and ſubject to be arreſted, if they go without the walls. It is with ſatisfaction, ſays that author, that I ſee the manufactories of Bow, Chelſea, and Stepney, have made ſuch a conſiderable progreſs in this manufacture. The French court ſeems to have very much at heart, the promotion of the new manufacture of porcelain, lately ſet up in the royal caſtle of Vincennes, with a view of equalling that of Saxony.

China-ware, for every 100 l. groſs value at the ſale pays, on importation, 34 l. 19 s. $7\frac{56\frac{1}{2}}{100}$ d. and, on exportation, draws back 32 l. 18 s. $7\frac{78}{100}$ d.

Glaſs PORCELAIN. See GLASS.

PORCELAIN SHELL, *porcellana*, in natural hiſtory, a genus of ſhell-fiſh, with a ſimple ſhell without any hinge, formed of one piece, and of a gibboſe figure on the back: the mouth is long, narrow, and dentated on each ſide; and the animal inhabitant is a limax.

To this genus belong the argus-ſhell and map-ſhell, ſo called from their ſpots and variegations; as alſo a multitude of other very elegant ſpecies. See plate CCVIII. fig. 1. where n° 1. repreſents the ſpecies, called the map-ſhell; n° 2. the argus-ſhell; and n° 3. two other ſpecies.

PORCH, in architecture, a kind of veſtible ſupported by columns; much uſed at the entrance of the antient temples, halls, churches, &c.

A porch, in the antient architecture, was a veſtible, or a diſpoſition of inſulated columns uſually crowned with a pediment, forming a covert place before the principal door of a temple, or court of juſtice. Such

Such is that before the door of St. Paul's Covent-Garden, the work of Inigo Jones. When a porch had four columns in front, it was called a tetraſtyle; when ſix, hexaſtyle; when eight, octoſtyle, *&c.* See the article TETRASTYLE, *&c.*

PORCUPINE, *biſtrix*, in zoology, a very ſingular genus of quadrupeds, belonging to the order of the glires. See the article QUADRUPEDS.

The fore-teeth of the porcupine are obliquely truncated, and it has no canine teeth: its ears are of a figure approaching to round, and the body is covered with prickles, or ſpines, and alſo with briſtles, like thoſe of a hog. The ſpines or quills, as they are commonly called, are of two kinds; ſome being ſhorter, thicker, ſtronger, and more ſharp-pointed; and others longer, weaker, and more flexible: theſe laſt are a foot long, and compreſſed at the point. The ſpines of the firſt kind are white at the baſe, and of a duſky cheſnut-colour on the upper part; and the latter kind are white at each extremity, and variegated with black and white in the middle. This terrible covering makes the creature appear much larger than it really is: it ſomewhat reſembles the badger in ſhape; and its length, from the noſe to the tail, is about two feet. See plate CCV. fig. 7.

The porcupine above deſcribed, is the common european kind, with four toes on the fore-feet, and five on the hinder. But beſides this, there are ſeveral other ſpecies, diſtinguiſhed by the number of their toes; as the american porcupine, with four toes on each of its feet; the eaſt-india porcupine, with five toes on each of its feet, *&c.*

PORCUPINE-FISH, *biſtrix*. See the article HISTRIX.

PORE, in anatomy, a little interſtice or ſpace between the parts of the ſkin, ſerving for perſpiration. See the articles CUTIS and PERSPIRATION.

The pores are moſt eaſily perceived in the hands and feet. In viewing the hand with a moderate glaſs, after its being well waſhed, we perceive innumerable little ridges of equal ſize and diſtance running parallel to each other, eſpecially on the tips and joints of the fingers, where they are regularly diſpoſed into ſpherical triangles and ellipſes: on theſe ridges, the pores are placed in even rows, and by a good eye may be diſcerned without a glaſs; but with one, every pore looks like a little fountain, in which the ſweat may be ſeen to riſe like clear rock-water. They are placed in the ridges, and not in the furrows between them, that they might be leſs able to be ſtopped by compreſſion; and on this account, the pores of the hands and feet are larger than the reſt.

PORELLA, in botany, a genus of moſſes, the anthera of which is multilocular and foraminoſe. See the article MOSS.

PORIA, a genus of funguſes, growing horizontally; but having its under ſide, not formed into lamellæ, but full of little holes or pores.

There are a great many ſpecies of poria, among which is the agaric of the ſhops. See AGARIC, and STYPTIC.

PORPESSE, in ichthyology, a ſpecies of the delphinus, with a coniform body, a broad back, and a ſubacute roſtrum: it is a very large fiſh, frequently confounded with the dolphin, from which it is different. See DELPHINUS and DOLPHIN.

PORPHYROGENITUS, in antiquity, an appellation given to the children of the eaſtern emperors, as being deſcended of parents who wore purple.

PORPHYRY, in natural hiſtory, a kind of ſtone of a plain uniform maſs, ſpotted with ſeparate concretions, of great hardneſs, giving fire with ſteel, not fermenting with acids, and very ſlowly and difficultly calcining in a ſtrong fire. See the article STONE.

Porphyry is of ſeveral ſorts, as 1. The porphyry of the antients, which is a moſt elegant maſs of an extremely firm and compact ſtructure, remarkably heavy and of a fine ſtrong purple, variegated more or leſs, with pale, red and white; its purple is of all degrees, from the claret-colour to that of the violet, and its variegations are rarely diſpoſed in veins, but ſpots, ſometimes very ſmall, and at others, running into large blotches. It is leſs fine than many of the ordinary marbles, but it excells them all in hardneſs, and is capable of a moſt elegant poliſh. It is ſtill found in immenſe ſtrata in Egypt. 2. The hard red-lead-coloured porphyry, variegated with black, white and green. This is a moſt beautiful and valuable ſubſtance. It has the hardneſs, and all the other characters of the oriental porphyry, and even greatly excels it in brightneſs, and in the beauty and variegation of its colours. It is found in great plenty in the iſland of Minorca, and is extremely worth importing,

porting, for it is greatly ſuperior to all the italian marbles. 3. The hard, pale-red porphyry, variegated with black, white and green. This is of a pale fleſh-colour; often approaching to white. It is variegated in blotches from half an inch to an inch broad. It takes a high poliſh, and emulates all the qualities of the oriental porphyry. It is found in immenſe ſtrata in Arabia Petræa, and in the Upper Egypt; and in ſeparate nodules in Germany, England and Ireland.

PORPHYRY-SHELL, a ſpecies of the purpura. See the article PURPURA.

PORRACEOUS, in medicine, a term applied to the bile, fæces, &c. when their colour approaches to that of a leek.

PORRUM, the LEEK, in botany, a ſpecies of allium, agreeing with the cepa, or onion, in medicinal virtues, being only accounted weaker. See the articles ALLIUM and CEPA.

PORT, a commodious place ſituated on the ſea-coaſt, or at the mouth of a river, ſcreened from the wind and the enterprizes of an enemy, with depth of water ſufficient for ſhips of burden, and where veſſels lie by to load and unload.

Ports are either natural or artificial; the natural are thoſe formed by providence, and the artificial ſuch as are formed with moles running into the ſea.

The city of Conſtantinople is called the Port, from its having one of the fineſt ports in Europe.

All the ports and havens in England are within the juriſdiction of the county; and the court of admiralty cannot hold juriſdiction of any thing done in them. 30 Hen. VI.

Bar-PORT, a port whoſe entrance is ſtopped up with a bar, or bank of ſand, and can only be entered at high water, as that of Dublin.

Cinque PORTS. See CINQUE PORTS.

Cloſe PORT, a port within the body of a city, as thoſe of Venice, Rhodes, and Amſterdam.

Free-PORT, in commerce, a port in which merchants of all nations may load and unload their veſſels, without paying any duties or cuſtoms; as thoſe of Leghorn, Genoa, &c.

The ſame term is alſo uſed in a more limited ſenſe for the ſame privilege granted to a ſet of merchants, with reſpect to the goods they import, and thoſe exported by them that are of the growth of the country. Such was the privilege the Engliſh for ſeveral years enjoyed after their diſcovery of the port of Archangel.

PORT is alſo uſed for the burden of a ſhip. See the article BURDEN.

The capacity of a veſſel is eſtimated by tons, each of which may contain about two thouſand pounds weight of ſea-water; but when it is ſaid that a veſſel is of the port, or burden, of five hundred tons, it is not meant that it bears five hundred tons weight of merchandize, but that the water which would be contained in the ſpace which the capacity of the veſſel poſſeſſes in the ſea, would weigh five hundred tons.

PORTS, in a ſhip, the ſame with port-holes. See the article PORT-HOLES.

PORT, among ſailors, denotes the larboard, or left ſide of the ſhip: thus to port a helm, is to put it on the left ſide of the ſhip, that the ſhip may go to the right.

PORT is alſo a ſtrong wine brought from Port-a-port, alſo called Porto and Oporto. See the article PORTO.

PORT *of the voice*, in muſic, the faculty or habit of making the ſhakes, paſſages, and diminutions in which the beauty of a ſong or piece of muſic conſiſts.

PORT-CRAYON, a pencil-caſe, which is uſually four or five inches long, and contrived ſo as that the pencil may ſlide up and down. Its inſide is round, and its outſide is ſometimes filed into eight ſides or faces, on which are drawn the ſector-lines: ſometimes it is made round both withoutſide and within, and has its length divided into inches and parts of inches.

PORT CULLICE, or HERSE. See the article HERSE.

PORT-DIEU, among the French, is a pariſh-prieſt; ſo called from his carrying the hoſt to ſick perſons.

PORTEN-BESSIN, a port-town of Normandy, in France, ſituated on the Engliſh-Channel: weſt longitude 50′, north latitude 49° 20′.

PORT-GLAIVE, SWORD-BEARER, an order of knights in Poland, confirmed by pope Innocent III. and ſent by him into Livonia, to defend the preachers of the goſpel againſt the infidels, at the firſt converſion of that country: but being too weak to accompliſh it, they united with the teutonic knights, and aſſumed the title of knights of the croſs.

PORT-GREVE, or PORT-GRAVE, was formerly the principal magiſtrate of maritime towns. The chief magiſtrate of London was antiently called by the

name, till Richard I. cauſed the city to be governed by two bailiffs, ſoon after which king John granted the city a mayor.

PORT-HOLES, in a ſhip, are the holes in the ſides of the veſſel, through which are put the muzzles of the great guns. Theſe are ſhut up in ſtorms to prevent the water from driving through them. The engliſh, dutch, and french ſhips, have the valves, or caſements, faſtened at the top of the port-holes, and the ſpaniſh veſſels aſide of them.

PORT-LAST, the ſame with the gun-wale of a ſhip. See the article GUN-WALE.

The yard is down a-port-laſt, when it lies down on the deck.

PORT L'ORIENT, in geography, a fortreſs and port-town of Britany in France, at the mouth of the river Blavet: weſt long. 3° 15′, north lat. 47° 42′.

PORT-LOUIS, a port-town of Britany in France, ſituated in the bay of Biſcay: weſt long. 3° 6′, north lat. 47° 42′.

PORT-MAHON, a port-town of the iſland of Minorca, ſituated on a fine bay at the eaſt end of the iſland, in eaſt long. 4° 6′, north. lat. 39° 50′.

PORT-MEN, a name given to the twelve burgeſſes of Ipſwich.

PORT-MOTE, a court held in port-towns, as a ſwanimote in a foreſt.

Port-motes are alſo held in ſome inland towns, as at Knolſt in Cheſhire.

PORT-NAILS, ſuch as are uſed to faſten the hinges to the ports of a ſhip.

PORT ROPES, in a ſhip. See the article ROPE.

PORT-ROYAL, the name of two monaſteries of ciſtercian nuns, in the dioceſe of Paris; the one near Chevreuſe, at the diſtance of five leagues from Paris, called Port-Royal of the Fields, and the other in Paris, in the Suburbs of St. James.

The nuns of the former of theſe monaſteries, proving refractory, were diſperſed, when many eccleſiaſtics, and others, who were of the ſame ſentiments as theſe religious, retired to Port-Royal, took apartments there, and printed many books: hence the name of Port-Royaliſts was given to all of their party, and their books were called books of Port-Royal: from hence we ſay the writers of Port-Royal, Meſſieurs de Port-Royal, and the tranſlations and grammars of Port-Royal.

PORT-ROYAL, in geography, a port-town, ſituated in the extremity of a long point of land, in the ſouth-eaſt part of the iſland of Jamaica: weſt long. 77°, north lat. 17° 30′.

PORT-ROYAL, an iſland on the coaſt of South-Carolina, which, with the neighbouring continent, forms one of the moſt commodious harbours in the britiſh plantations: weſt longitude 80°, north latitude 31° 45′.

PORT-ROYAL, in Acadia, the ſame with Annapolis. See ANNAPOLIS.

PORT ST. MARY'S, a port-town of Andaluſia in Spain, ten miles north-eaſt of Cadiz.

PORT-VENT, in an organ, is a wooden pipe which ſerves to convey the wind from the bellows to the ſound-board. See the article ORGAN.

PORTA, or VENA PORTA, in anatomy, one of the three primary veins of the human body.

The vena-porta in its ſtructure has ſome reſemblance of a tree; the roots or inferior branches of which are divided into the right and left. From the right ariſe all the meſeriac veins of the inteſtines, the internal hæmorrhoidal, and the right epiploics: and from the left, which is called the ſplenic vein, ariſe the gaſtric veins, which are various; and form the coronary vein of the ſtomach; the vaſa brevia, the epiploic, and the gaſtro-epiploic veins; the pancreatic, and ſometimes alſo the internal hæmorrhoidal vein. The trunk of the vena-porta, which goes to the liver, affords the cyſtic veins, the right gaſtric, the duodenal, and this laſt often the pancreatic. In the branches, where the trunk begins to explicate, it conſtitutes the ſinus-portæ in the liver; and from this it is divided into innumerable branches, which are diſperſed through the whole ſubſtance of the liver.

PORTAIL, in architecture, the frontiſpiece of a church viewed on the ſide on which is the great door.

Portail is alſo uſed for the great door of a palace, caſtle, &c.

PORTAL, in architecture, a little gate where there are two gates of a different bigneſs; alſo a little ſquare corner of a room cut off from the reſt by the wainſcot, and forming a ſhort paſſage into the room. The ſame name is alſo ſometimes given to a kind of arch of joiners work before a door.

PORTALEGRE, a city of Portugal, in the

the province of Alentejo, eighty miles east of Liſbon.

PORTATE, or a CROSS-PORTATE, in heraldry, a croſs which does not ſtand upright, as croſſes generally do, but lies across the eſcutcheon in bend, as if it were carried on a man's ſhoulders. See plate CCV. fig. 4.

PORTENTRU, a city of Switzerland, in the biſhopric of Baſil: east longitude 7°, north latitude 47° 30′.

PORTER, in the circuit of juſtices, an officer who carries a white rod before the juſtice in eyre, ſo called *a portando virgam*.

Groom-PORTER. See GROOM-PORTER.

PORTER is alſo a kind of malt-liquor, which differs from ale and pale-beer in its being made with high-dried malt. See the articles ALE and BEER.

PORTERAGE, a duty paid at the cuſtom-houſe to thoſe who attend at the water-ſide, and belong to the package-office.

There are tables hung up aſcertaining the porterage for landing and ſhipping goods.

PORTICO, in architecture, a kind of gallery on the ground, ſupported by columns, where people walk under covert. Though this word is derived from *porta*, a gate or door, yet it is uſed for any diſpoſition of columns which form a gallery.

PORTIO, PORTION, a part or diviſion of any thing. Thus *portio dura*, and *portio mollis*, in anatomy, is a portion of the ſeventh pair of nerves of the brain. See the articles AUDITORY NERVES.

PORTION, in law, a part, or proportion, either of money given with a daughter, or of an inheritance.

PORTION, in the canon-law, is that proportion or allowance which a vicar receives out of a rectory or impropriation.

PORTIONER, is where a parſonage is ſerved by two or more clergymen alternately, in which caſe the miniſters are called portioners, becauſe they have only their proportion of the tithes or profits of the living.

PORTLAND, a peninſula in Dorſetſhire, ſituated in the Engliſh channel, ten miles ſouth of Dorcheſter, famous for producing the beſt free-ſtone.

PORTLAND STONE is a dull whitiſh ſpecies of pſadurium, much uſed in buildings about London: it is compoſed of a coarſe grit, cemented together by an earthy ſpar: it will not ſtrike fire with ſteel, but makes a violent effervescence with aqua-fortis. See FREE-STONE.

PORTMANTEAU, a cloak bag of cloth, leather, *&c.* in which the cloak, linen, and other habilaments of travellers are diſpoſed and laid on the horſe's crupper.

The ſame name is alſo given to a piece of joiner's work faſtened to the wall in a wardrobe, armory, *&c.* proper for the hanging on of cloaks, hats, *&c.*

PORTMANTEAU, is alſo an officer under the king of France, of which there are twelve, whoſe buſineſs it is to keep the king's gloves, cane, ſword, *&c.* to take them from him, and to bring them again when wanted. The dauphin has alſo his portmanteau, and the romiſh biſhops their port-croix, port-mitres, *&c.* that is, their crozier-bearers, mitre-bearers, *&c.*

PORTO, or OPORTO, a city and port-town of Portugal, in the province of Entre-Minho-Douro: weſt longitude 9°, north latitude 41° 10′.

PORTO-BELLO, a port-town of America, ſituated on the narroweſt part of the iſthmus of Darien: weſt long. 82°, north lat. 10°.

PORTO-CAVALLO, or PORTO-CABELO, a port-town of Terra-Firma, in America, on the Caraccos-coaſt: weſt longitude 67° 30′, north latitude 10° 30′.

PORTO-FARINO, a port-town of Tunis, a little weſt of the ruins of Carthage: eaſt longitude 9°, north latitude 36° 30′.

PORTO-FERAJO, a port-town on the north ſide of the iſle of Elba, in the Tuſcan-Sea: eaſt long. 11° 30′, north lat. 42° 35′.

PORTO-GALLETO, a port-town of the province of Biſcay, in Spain, eight miles north of Bilboa.

PORTO-HERCOLE, a port-town of Tuſcany, ſituated on a bay of the Tuſcan-Sea: eaſt long. 12°, north lat. 42° 20′.

PORTO-LONGONE, a port-town on the eaſt end of the iſle of Elba, in the Tuſcan-ſea.

PORTO-RICO, an iſland in the american ocean, one hundred and twenty miles long, and ſixty broad, which produces ſugar, rum, and ginger: ſituated between 64° and 68° of weſt longitude, and in 8° of north lat. ſubject to Spain. The capital is alſo called Porto-Rico, and St. John's city.

PORTO-SANTO, the leaſt of the Madeira iſlands, eighteen miles in circumference, we

weſt longitude 16°, north latitude 33°.

PORTO-VECCHIO, a port-town of the iſland of Corſica, forty miles north of Sardinia.

PORTO-VENERO, a port-town of Italy, in the territory of Genoa, forty-five miles ſouth eaſt of Genoa.

PORTRAIT, POURTRAIT, or POURTRAITURE, in painting, the repreſentation of a perſon, and eſpecially of a face done from the life.

In this ſenſe we uſe the term portrait-painting, in contradiſtinction to hiſtory-painting, where a reſemblance of perſon is uſually diſregarded. Portraits, when as large as the life, are uſually painted in oil-colours; ſometimes they are painted in miniature with water-colours, crayons, paſtils, &c.

PORTSMOUTH, a borough and port-town of Hampſhire, ſituated on a fine bay of the Engliſh channel; it has one of the moſt ſecure, capacious, and beſt fortified harbours in England: weſt long. 1° 6′, north lat. 50° 48′.

This town ſends two members to parliament.

PORTUGAL, the moſt weſterly kingdom in Europe; it is about three hundred miles long, and one hundred broad, and is ſituated between 7° and 10° of weſt longitude, and between 37° and 42° of north latitude; being bounded by Spain on the north and eaſt, and by the Atlantic ocean on the ſouth and weſt. This country is neither ſo hot nor ſo fruitful as Spain; it however produces plenty of grapes, olives, oranges and lemons.

PORTUGALLICA TERRA, *earth of Portugal*, in the materia medica, the name of a fine aſtringent bole, dug in great plenty in the northern parts of Portugal, and eſteemed a remedy againſt poiſons and venomous bites, and good in malignant fevers. Whatever may be its virtues of this kind, however, it is manifeſtly an aſtringent of the very firſt claſs, and is uſed with great ſucceſs in fluxes of all kinds. It is well known in ſome parts of the world, beſide the kingdom where it is produced; but is not known in the engliſh ſhops. The cheapneſs of our ſophiſticated bole-armenic, having excluded this whole valuable claſs of medicines from our practice. See the article BOLE.

The characters by which the portugueſe earth is known from the other red boles, are theſe: it is of a cloſe, compact, and regular texture, conſiderably heavy, and of a fine florid red, of a ſmooth and ſhining ſurface, eaſily breaking between the fingers, and a little ſtaining the hands. It adheres firmly to the tongue, melts freely and readily in the mouth, and has a ſtrongly aſtringent taſte, but leaves a little grittineſs between the teeth. It does not ferment with acids, and ſuffers ſcarce any change of colour in the fire.

PORTULACA, PURSLAIN, in botany. See the article PURSLAIN.

PORUS, in general, denotes a pore. See the article PORE.

PORUS BILARIUS, according to ſome, is the ſame with the hepatic duct; but others make a diſtinction between them, and obſerve, that the ductus hepaticus runs from the liver to the ductus choledocus; and that the branches of this diſtributed through the whole liver, make what are called the pori biliarii.

PORUS, in natural hiſtory, a name given by authors to a peculiar kind of foſſil coral, of which there are many different ſpecies; theſe are all of a beautifully laminated ſtructure, and ſeem allied to the mycetitæ or fungitæ; they are ſeldom found looſe, but uſually bedded in hard marble, and with their pores filled up with ſparry or mineral matter. See the article CORAL.

POSE′, in heraldry, denotes a lion, horſe, or other beaſt ſtanding ſtill, with all his four feet on the ground.

POSEGA, the capital of Sclavonia, ſituated on the river Orana: eaſt long. 18° 42′, north lat. 45° 35′.

POSEN, or BOLZANO, a town of Germany, in the circle of Auſtria, and biſhopric of Trent: eaſt long. 11° 20′, north lat. 46° 30′.

POSIDIUM, ποσειδεων, in antient chronology, the ſeventh month of the athenian year; which conſiſted of thirty days, anſwered to the latter part of December and beginning of January, and had its name from a feſtival in honour of Neptune Poſidonius kept in it.

POSITION, or SITUATION, in phyſics, an affection of place, which expreſſes the manner of any body's being therein. See the articles BODY and PLACE.

POSITION, in architecture, denotes the ſituation of a building with regard to the points of the horizon. Vitruvius directs the poſition of a building to be ſuch, as that the four corners point directly to the four cardinal winds.

Circles of POSITION. See CIRCLE.

POSITION, in dancing, the manner of diſpoſing the feet, with regard to each other. There are four regular poſitions: the firſt is when the feet are joined in a line parallel to the ſhoulders; the ſecond, when the heels are perpendicularly under the ſhoulders, and of conſequence the width of the ſhoulders apart; the third is when one foot is before the other, in ſuch a manner as that the heel is in the cavity formed by the rotula and carpus of the foot; the fourth, when one foot is the width of the ſhoulders apart from the other, the heel ſtill anſwering to the cavity above-mentioned, which is the only regular manner of walking.

POSITION, or the *rule of falſe* POSITION, otherwiſe called the *rule of* FALSHOOD, in arithmetic, is a rule ſo called, becauſe in calculating on ſeveral falſe numbers taken at random, as if they were the true ones, and from the differences found therein, the number ſought is determined. This rule is either ſingle or double. Single poſition, is when there happens in the propoſition ſome partition of numbers into parts proportional, in which caſe the queſtion may be reſolved at one operation, by this rule. Imagine a number at pleaſure, and work therewith according to the tenor of the queſtion, as if it were the true number: and what proportion there is between the falſe concluſion and the falſe proportion, ſuch proportion the given number has to the number ſought. See PROPORTION.

Therefore the number found by argumentation, ſhall be the firſt term of the rule of three; the ſecond number ſuppoſed, the ſecond term; and the given number, the third. See RULE *of Three*.

Or the reſult is to be regulated by this proportion, *viz.* As the total ariſing from the error to the true total, ſo is the ſuppoſed part to the true one. Example, A, B and C deſigning to buy a quantity of lead to the value of 140 l. agree that B ſhall pay as much again as A, and C as much again as B; what then muſt each pay?

Now ſuppoſe A to pay 10 l. then B muſt pay 20 l. and C 40 l. the total of which is 70 l. but ſhould be 140 l. Therefore, If 70 l. ſhould be 140 l. what ſhould 10 l. be?

Anſwer, 20 l. for A's ſhare, which doubled makes 40 l. for B's ſhare, and that again doubled gives 80 l. for C's ſhare, the total of which is 140 l.

Double poſition, is when there can be no partition in the numbers to make a proportion. In this caſe, therefore, you muſt make a ſuppoſition twice, proceeding therein according to the tenor of the queſtion. If neither of the ſuppoſed numbers ſolve the proportion, obſerve the errors, and whether they be greater or leſs than the ſuppoſition requires, and mark the errors accordingly with the ſign + and —. See CHARACTER.

Then multiply contrarywiſe the one poſition by the other error, and if the errors be both too great, or both too little, ſubtract the one product from the other, and divide the difference of the products by the difference of the errors. If the errors be unlike, as the one + and the other —, add the products, and divide the ſum thereof by the ſum of the errors added together: for the proportion of the errors is the ſame with the proportion of the exceſſes or defects of the numbers ſuppoſed to be the numbers ſought: or the ſuppoſitions and their errors being placed as before, work by this proportion as a general rule, *viz.* as the difference of the errors if alike; or their ſum, if unlike, to the difference of the ſuppoſitions, ſo either error to a fourth number, which accordingly added to or ſubtracted from the ſuppoſition againſt it, will anſwer the queſtion.

POSITION, in geometry, is a term ſometimes uſed in contradiſtinction to magnitude: thus a line is ſaid to be given in poſition, *poſitione data*, when its ſituation, bearing, or direction, with regard to ſome other line is given: on the contrary, a line is given in magnitude, when its length is given, but not its ſituation.

POSITION is alſo uſed for a theſis or propoſition maintained in the ſchools. See the article THESIS.

POSITIVE, a term of relation ſometimes oppoſed to negative; hence a poſitive quantity, in algebra, is a real or affirmative quantity, or a quantity greater than nothing: thus called in oppoſition to a privative or negative quantity, which is leſs than nothing, and marked by the ſign —. Poſitive quantities are deſigned by the character + prefixed or ſuppoſed to be prefixed to them. See NEGATIVE, QUANTITY, and CHARACTER.

POSITIVE is alſo uſed in oppoſition to relative or arbitrary: thus we ſay beauty is

is no positive thing, but depends on the different tastes of people. See the article RELATIVE.

It is also used in opposition to natural: thus we say, a thing is of positive right, meaning that it is founded on a law which depends absolutely on the authority of him who made it. See the article NATURAL.

POSITIVE DEGREE, in grammar, is the adjective in its simple signification, without any comparison; or it is that termination of the adjective, which expresses itself simply, and absolutely, without comparing it with any other; thus, *durus*, hard, *mollis*, soft, &c. are in the positive degree: but *durior*, harder, and *mollior*, softer, &c. in the comparative degree; and *durissimus*, hardest, and *mollissimus*, softest, &c. in the superlative degree. See the articles COMPARATIVE and SUPERLATIVE.

POSITIVE, in music, denotes the little organ usually placed behind or at the feet of an organist, played with the same wind. and the same bellows, and consisting of the same number of pipes with the larger one, though those much smaller, and in a certain proportion: this is properly the choir-organ. See ORGAN.

POSSE COMITATUS, in law, signifies the power of the county, or the aid and assistance of all the knights, gentlemen, yeomen, labourers, servants, apprentices, &c. and all others within the county that are above the age of fifteen, except women, ecclesiastical persons, and such as are decrepit and infirm.

This posse comitatus is to be raised where a riot is committed, a possession kept upon a forcible entry, or any force of rescue used, contrary to the king's writ, or in opposition to the execution of justice; and it is the duty of all sheriffs to assist justices of the peace in the suppression of riots, &c. and to raise the posse comitatus, or to charge any number of men for that purpose.

POSSESSIO FRATRIS, in law, is where a man seised of lands in fee, having issue a son and a daughter by one wife, and a son by a second wife, dies; and the first son enters as heir to his father, and he also dies, without issue. In this case the daughter may enter, and shall have possession of the lands as heir to her brother. Yet if the eldest son happens to die, not having made an actual entry and seisin, the son by the second wife may enter as heir to his father, and shall enjoy the estate, and not the sister.

POSSESSION, in law, the holding or occupying of any thing, either de jure or de facto.

Possession de jure, is the title a man has to enjoy a thing, though it be usurped and in the actual possession of another; or where lands are descended to a person, and he has not yet entered into them: and possession de facto, or actual possession, is where there is an actual and effectual enjoyment of a thing. A long possession is much favoured by the law, as an argument of right, even though no deed can be shewn, and it is more regarded than an antient deed without possession. Thus annual possession gives a right to moveables; a triennial and peaceable possession of a benefice is sufficient to maintain it, provided it be founded on a plausible title; a possession of an estate for ten years by one present, and of twenty years by one absent, with a title, or of thirty years without any, gives a full right; but a centenary possession, which constitutes possession immemorial, is the best and most indisputable of all titles.

If he that is out of possession of land brings an action, he must prove an undeniable title to it; and when a person would recover any thing of another, it is not sufficient to destroy the title of the person in possession, without he can prove that his own right is better than his.

In order to make possession lawful upon an entry, the former possessor and his servants are to be removed from off the premises entered on: but a person by lease and release, is in possession without making any entry upon the lands. See ENTRY, DISSEISIN, INDUCTION, &c.

POSSESSIVE, in grammar, a term applied to pronouns which denote the enjoyment or possession of any thing, either in particular or in common: as *meus*, mine, and *tuus*, thine; *noster*, ours, and *vester*, yours. See the article PRONOUN.

POSSIBILITY, *possibilitas*, in law, is defined to be any thing that is altogether uncertain, or what may or may not be, and is taken to be either near or remote. A near possibility, is where an estate is limited to one after another's decease, whilst a remote possibility is something extraordinary that is never likely to come to pass.

The law does not regard a remote possibility, nor may any possibility, right, or choice in action, &c. be granted or assigned

aſſigned to a ſtranger; though where it is founded on a truſt it differs from a mere poſſibility, and therefore it is ſaid to be deviſed by will, but the other cannot be ſo.

POSSIBILITY alſo denotes a non-repugnance to exiſting, in any thing that does not any way exiſt. See the articles POSSIBLE and IMPOSSIBLE.

This non-repugnance to exiſting, is no other than the producibility of any thing; which conſiſts in this, that there are ſufficient cauſes actually exiſting, or at leaſt poſſible, whereby the thing may be produced, or be brought to exiſt, principally as there is a God, or an almighty cauſe; ſo that poſſibility does not imply any thing in the thing poſſible, but is a mere extrinſic denomination, taken from the power of the cauſe, and principally of God. In effect, if any creatable thing had any intrinſic poſſibility, it would follow that ſuch a thing muſt even exiſt without the cauſe; and yet we may allow an intrinſic poſſibility of a thing, if by poſſibility we do not underſtand its producibility, or its non-repugnance to exiſt, but only the non-repugnance of the attributes contained in its idea. But ſuch poſſibility is merely logical.

POSSIBLE, *poſſibile*, is ſometimes oppoſed to real exiſtence, and underſtood of a thing which, though it does not actually exiſt, yet may exiſt; as a new ſtar, another world, *&c.* which are particularly ſaid to be phyſically poſſible. It is alſo oppoſed to impoſſible, in which ſenſe it is applicable to any thing that does not contradict itſelf, or involve contradictory predicates, whether it actually exiſt or not, as a man, fire, *&c.* theſe are alſo ſaid to be logically poſſible. See the article IMPOSSIBLE.

Poſſibles are reckoned to be threefold, *viz.* future, potential, and merely poſſible. Future poſſible, is that whoſe production is decreed and aſcertained, *v. gr.* the futurition of all thoſe events fixed by the immutable decree of the Almighty. Potential poſſible, is that which is contained, or lies hid, in its cauſes; as the tree in the ſeed, the fruit in the tree, *&c.* And mere poſſibility, is that which might exiſt, though it never ſhall.

Others diſtinguiſh poſſibles into metaphyſical, phyſical, and ethical. Metaphyſical poſſible, is that which may at leaſt be brought to being by ſome ſupernatural and divine power, as the reſurrection of the dead. Phyſical poſſible, is that which may be effected by a natural power, as to overturn the turkiſh empire: and ethical poſſible, is that which may be done by prudent perſons, uſing all the proper means they have for the ſame.

POSSUM, or OPOSSUM, in ichthyology. See the article OPOSSUM.

POST, a courier or letter-carrier, or one who frequently changes horſes, poſted or placed on the road, for quicker diſpatch. The word is alſo applied to the houſes where ſuch a perſon takes up and lays down his charge.

In England, poſts were firſt eſtabliſhed by act of parliament in the twelfth year of the reign of Charles II. which enabled the king to ſettle a poſt-office, and appoint a governor. The general poſt-office in Lombard-ſtreet, London, is now managed by two poſt-maſters general, who have under them about forty other officers of their own appointing, as the receiver-general, accomptant-general, ſecretary, ſolicitor, reſident and principal ſurveyor, comptroller, accomptant, clerk of the franks, ſix clerks of the ſeveral roads with their aſſiſtants, a window-man, and ten ſorters for the inland office: beſides which there are for the foreign office a receiver-general, an accomptant-general, a ſecretary, a comptroller, and alphabet-keeper, a ſolicitor, ſupervifor of the letter-carriers, ſix clerks, *&c.* and twenty-three letter-carriers.

On this grand office depend one hundred and eighty poſt-maſters in England and Scotland, who keep regular offices for their ſeveral ſtages, and ſub-poſt-maſters in their branches; and ſuch is the diſpoſition of the ſtages, that there is no conſiderable market-town in England but has an eaſy and certain conveyance for letters to and from the ſaid office in the due courſe of the mails every poſt.

For foreign intelligence in times of peace, Mondays and Thurſdays are the poſt-days to France, Spain and Italy: Tueſdays and Fridays for Holland, Germany, Denmark, and Sweden; on Mondays and Fridays the poſt alſo goes for Flanders, and from thence to Germany, Denmark, and Sweden; and on the laſt Thurſday of every month a packet-boat ſet outs from the Thames for Barbadoes, Monſerrat, Nevis, St. Chriſtopher's, Antego, and Jamaica. Letters are ſent to all parts of England, Scotland, and Ireland, except Wales, on Tueſdays, Thurſ-

Thurſdays, and Saturdays, and are returned from all parts of England and Scotland every Monday, Wedneſday, and Friday; from Wales, every Monday and Friday; and from Kent and the Downs, and a great many towns in other parts of England every day.

The charge of a letter of a ſheet of paper eighty miles, is 3 d. of two ſheets, 6 d. For above eighty miles, a ſheet, 4 d. two, 8 d. An ounce of letters for eighty miles, 1 s. for above, 1 s. 6 d. *&c.* A ſingle ſheet from London to Edinburgh or Dublin, 6 d. *&c.*

The poſt travels at the rate of one hundred and twenty miles in twenty-four hours. And for thoſe who chooſe to travel the poſt, horſes are ready at the rate of 3 d. per mile, and 4 d. to the poſt-boy every ſtage.

The great mogul performs part of his poſtage by pigeons, kept in ſeveral places for the conveyance of letters upon extraordinary occaſions, and theſe carry them from one end of that vaſt empire to the other. Tavernier obſerves, that at this day the conſul of Alexandretta ſends news daily to Aleppo, in five hours time by means of pigeons; though theſe places are diſtant three days journey on horſeback.

enny-POST, a poſt eſtabliſhed for the benefit of London and the adjacent parts; by which any letter or parcel not exceeding ſixteen ounces weight, or ten pounds value, is ſpeedily conveyed to and from all parts within ten miles of London.

This office is managed by a comptroller; under whom are a collector, an accomptant, ſix ſorters, eight ſub-ſorters, and ſixty-nine meſſengers.

OST, in the military art, is any place or ſpot of ground fortified or not, where a body of men may make a ſtand and fortify themſelves, or remain in a condition to fight an enemy. Hence it is ſaid, that the poſt was relieved, the poſt was taken ſword in hand, *&c.*

dvanced POST, is a ſpot of ground ſeized by a party to ſecure the army, and cover the poſts that are behind.

OSTS, in building, large pieces of timber placed upright in houſes. The poſts framed into breſſummers for ſtrengthening the carcaſe of a houſe, are called brick-poſts, and the corner poſts are called the principal poſts.

Burning a little the ends of the poſts that are to be ſet into the ground, is ſaid to be an excellent method to prevent them from rotting.

POSTS, in ſculpture, are ornaments formed after the manner of rolls or wreathings; ſome of which are ſimple, and others enriched, or flouriſhed.

POST, AFTER, a latin prepoſition uſed in compoſition with ſeveral engliſh words, and generally implying a relation of poſteriority. Thus poſt-diem, in law, is uſed where any writ is returned by the ſheriff after the day aſſigned; for which neglect the cuſtos brevium has fourpence. Poſt diſſeiſin, is a writ which lies for a perſon who has recovered lands, *&c.* by præcepe quod reddat, upon default or reddition, is again diſſeiſed by the former diſſeiſor. Poſt-fine, is a certain duty payable to the king for a fine formerly acknowledged in his court; paid by the cognizee after the fine is fully paſſed, and all things touching the ſame are accompliſhed. Poſt-term, or poſt-terminum, is a return of a writ not only after the day aſſigned for its return, but alſo after the term; on which the cuſtos brevium has a fee of 20 d. This word is alſo uſed for the fee ſo taken.

POSTDAM, or POTSDAM, a town of Germany, in the marquiſate of Brandenburg, ten miles ſouth-weſt of Berlin.

POSTEA, in law, is the return of a record of the proceedings in a cauſe after a trial and verdict by writ of niſi prius, into the court of common pleas, after a verdict; and there afterwards recorded.

POSTERIOR, a term of relation implying ſomething behind, or that comes after another, in which ſenſe it is uſed in oppoſition to prior and anterior.

POSTERIORITY, in law, coming after, a term uſed in oppoſition to priority; as where a perſon holds lands or tenements of two lords, he is ſaid to hold of his antienter lord by priority, and of his latter lord by poſteriority.

POSTERN, in fortification, is a ſmall gate generally made in the angle of the flank of a baſtion, or in that of the curtin, or near the orillon, deſcending into the ditch; by which the garriſon may march in and out unperceived by the enemy, either to relieve the works, or to make private ſallies, *&c.*

POSTHUMOUS, a child born after the death of his father, or taken out of the body of a dead mother, from whence it is frequently applied to the works of an author not publiſhed till after his deceaſe.

Among

Among the Romans it was alſo uſed for a child born after the making of a will, which made it neceſſary for the teſtator to alter it.

POSTIL, a name antiently given to a note in the margin of the bible, and afterwards to one in any other book poſterior to the text.

POSTING, among merchants, the putting an account forward from one book to another, particularly from the journal or waſte-book to the ledger. See the article BOOK.

POSTIQUE, in architecture, an ornament of ſculpture ſuperadded after the work is done. A table of marble, or other matter, is alſo ſaid to be poſtique, when it is incruſtated in a decoration of architecture, &c.

POSTLIMINIUM, or POSTLIMINY, among the Romans, the return of one who had gone to ſojourn elſewhere, or had been baniſhed or taken by an enemy, to his own country and ſtate.

POSTPONING, putting any thing after or behind another, with regard to time.

POSTSCRIPT, an article added to a letter or memoir, containing ſomething learnt or recollected after the piece was written.

POSTULATE, *poſtulatum*, in mathematics, &c. is deſcribed to be ſuch an eaſy, and ſelf-evident ſuppoſition, as needs no explication or illuſtration to render it intelligible; as, that a right line may be drawn from one point to another. That a circle may be deſcribed on any center given, of any magnitude, &c. however, authors are not well agreed as to the ſignification of the term poſtulatum; ſome make the difference between axioms and poſtulata to be the ſame as that between theorems and problems; axioms, according to thoſe authors, being indemonſtrable theoretical truths. But others will have it, that axioms are primitive and common to all things, partaking of the nature of quantity, and which therefore may become the objects of mathematical ſcience: ſuch as number, time, extenſion, weight, motion, &c. and that poſtulata relate particularly to magnitudes, ſtrictly ſo called, as to things having local extenſion, ſuch as lines, ſurfaces, and ſolids; ſo that in this ſenſe of the word poſtulatum, Euclid, beſides axioms, or thoſe principles which are common to all kinds of quantities, has aſſumed certain poſtulata to be granted him peculiar to extenſive magnitude. Hence ſeveral of the principles aſſumed in his elements, and ranked among the axioms by the moderns, are by Proclus ranked among the poſtulata, which has induced Dr. Wallis to judge, that the laſt of the two ſenſes given to the term poſtulatum is moſt agreeable to the meaning of the antient geometers.

POSTULATION, *Poſtulatio*, in the canonlaw, the nomination of a perſon to a dignity in the church, to which by the canons he cannot be elected, as for want of age, of birth, being already poſſeſſed of a benefice incompatible therewith, or the like impediment. Thus the formal election of ſuch a perſon being faulty, they are obliged to proceed by way of poſtulation, that is, the chapter beſeeches the perſon to whom the confirmation of the election belongs to approve of it, though it be not canonical. See the article ELECTION.

POSTURE, in painting and ſculpture, the ſituation of a figure with regard to the eye, and of the ſeveral principal members thereof with regard to one another, whereby its action is expreſſed. A conſiderable part of the art of a painter, conſiſts in adjuſting the poſtures, in giving the moſt agreeable poſtures to his figures, in accommodating them to the characters of the reſpective figures, and the part each has in the action, and in conducting and purſuing them throughout.

Poſtures are either natural or artificial. Natural poſtures are ſuch as nature ſeems to have had a view to, in the mechaniſm of the body, or rather ſuch as the ordinary actions and occaſions of life lead us to exhibit while young, and the joints, muſcles, ligaments, &c. are flexible. Artificial poſtures, are thoſe which ſome extraordinary views, or ſtudies, occaſion us to learn: as thoſe of dancing, fencing, &c.

POTABLE, *Potabilis*, ſomething that may be ſwallowed by way of drink.

POTAMOGETON, POND-WEED, in botany, a genus of the tetrandria-tetragynia claſs of plants, the corolla whereof conſiſts of four roundiſh, obtuſe, hollow, patent, and unguiculated petals; there is no pericarpium, the ſeeds are four in number, roundiſh and accuminated, gibbous on one ſide, and compreſſed and angulated on the other. The plant has a refrigerating virtue, and is recommended in the cure of old ulcers.

POTANCE, in heraldry, a croſs like that repreſented in plate CCV. fig. 5.

POT-ASH, the lixivious-aſhes of certain vegetables, uſed in the making of glaſs, ſoap, &c. See GLASS, SOAP, &c.

The method of making pot-aſh is directed by Dr. Shaw, as follows. Burn a quantity of billet-wood to grey aſhes, and taking ſeveral pounds of theſe aſhes, boil them in water, ſo as to make a very ſtrong lixivium, or lye. Let this lye be ſtrained through a coarſe linen cloth, to keep out any black parts of the half-burnt wood, that might happen to remain in the aſhes; then evaporate this ſtrained lye in an iron-pan over a quick fire almoſt to drineſs: then taking out the matter remaining at the bottom, and putting it into an iron crucible, ſet it in a ſtrong fire till the matter is melted, and then immediately pour it out upon an iron-plate, where it ſoon cools, and appears in the form of a ſolid lump of pot-aſh. Much after this manner, is pot-aſh made in the large way of buſineſs, for the ſervice of the ſoap-boiler, and glaſs-maker, fuller, &c. but according to the difference of the wood, or combuſtible matter employed, with the manner of turning it, and conducting the proceſs, different kinds of pot-aſh are prepared. There are certain ſaline-plants that yield this pot-aſh to great advantage, as particularly the plant kali; there are others that afford it in leſs plenty, and of an inferior quality, as bean-ſtalks, &c. but in general, all vegetable ſubjects afford it of one kind or other, and may moſt of them be made to yield it tolerably perfect after the manner of the proceſs already laid down, even the lopings, roots, and refuſe parts of ordinary trees, vine clippings, &c. The fixed ſalts of all vegetables when reduced to abſolute purity, or intirely ſeparated from the other principles, appear to be one and the ſame thing: whence it ſhould ſeem, ſays Dr. Shaw, that by a ſuitable management, good ſaleable pot-aſh might be made in all places, where vegetable matters abound. For if by examining Ruſſia pot-aſh, for example, we find that its ſuperior excellence depends upon its being clear of earth, or upon its containing a large proportion of oil, or fixed ſalt, theſe advantages may, by properly regulating the operation, be given to engliſh pot-aſhes, ſo as perhaps to render the latter as good as the former: but where the pot-aſh of any remarkable ſaline vegetable is to be imitated, that of the kali, for example, the doctor recommends a prudent ſprinkling of the ſubject with ſalt, or ſea water, in the burning; and by theſe ways properly diverſified, any principle that is naturally wanting, might be artificially introduced ſo as to perfect the art of pot-aſh.

Two other methods of making pot-aſh have been publiſhed ſome years ago, in conſequence of an encouragement granted by parliament for that purpoſe, one by Mr. Thomas Stephens, and the other aſcribed to the late Sir Peter Warren.

Pot-aſhes the barrel containing two hundred weight, pay on importation 12 s. $3\frac{75}{100}$ d. and draw back on exportation, 11 s. $\frac{62\frac{1}{2}}{100}$ d.

POTATOE, in botany, the engliſh name for a ſpecies of the tuberoſe-rooted ſolanum. See the article SOLANUM.

POTENT, or POTENCE, in heraldry, a term for a kind of a croſs, whoſe ends all terminate like the head of a crutch. It is otherwiſe called the jeruſalem croſs, and is repreſented in plate CCV. fig. 6.

POTENTIA, POWER, that whereby a thing is capable either of acting, or being acted upon. See POWER.

POTENTIAL, in the ſchools, is uſed to denote and diſtinguiſh a kind of qualities, which are ſuppoſed to exiſt in the body in potentia only, by which they are capable in ſome manner of affecting and impreſſing on us the ideas of ſuch qualities, though not actually inherent in themſelves; in which ſenſe we ſay, potential heat, potential cold. See the articles HEAT and COLD.

It is alſo uſed by ſchoolmen, for ſomething that has the quality of the genus. A potential whole, is that which has its parts under it as a genus has its ſpecies, to diſtinguiſh it from an actual whole, which has its parts in itſelf, as a body compoſed of matter and form.

POTENTIAL, in medicine. Cauteries are diſtinguiſhed into actual and potential. See the article CAUTERY.

POTENTIAL, in grammar, an epithet applied to one of the moods of verbs. The potential is the ſame in form with the ſubjunctive, and is according to Ruddiman implied in that mood, for which reaſon that grammarian rejects it: but others will have it to differ from the ſubjunctive in this, that it always implies in it either *poſſum*, *volo*, or *debeo*. It is ſometimes called the permiſſive mood, becauſe it often implies a permiſſion or con-

conceſſion to do a thing. See the articles MOOD, and SUBJUNCTIVE.

POTENTILLA, SILVER-WEED, WILD-TANSEY, or CINQUEFOIL, in botany, a genus of the icoſandria-pentagynia claſs of plants, the corolla whereof conſiſts of five roundiſh patent petals, inſerted by their ungues into the calyx: there is no pericarpium, the receptacle of the ſeeds is roundiſh, ſmall, and permanent, and is covered by the cup and ſurrounded with the ſeeds, which are numerous and acuminated.

This plant is ſaid to poſſeſs in a great meaſure the virtues of the peruvian bark; whence the expreſſed juice of it is much recommended in intermitting fevers: a decoction of it is of great uſe in the fluor albus, and the ſeeds and root of it are ſaid to cure a diarrhœa and hæmorrhage.

POTENZA, a city of Italy in the kingdom of Naples in the Baſilicate, ſituated in eaſt long. 16° 40′, north lat. 40° 40′.

POTERIUM, BURNET, in botany, a genus of the monoecia polyandria claſs of plants, the corolla whereof is formed of a ſingle petal, divided into four roundiſh concave patent ſegments, growing together at the baſe: the fruit is a berry, the outer cruſt of which is formed of the indurated tube of the corolla; the ſeeds are two.

POTHOS, in botany, a genus of the gynandria-polyandria claſs of plants, the ſpatha of which is globoſe: the corolla conſiſts of four petals; and the fruit is a berry, containing ſeveral ſeeds.

POTION, *Potio*, a liquid medicine, conſiſting of as much as can be drank at one draught. The writers on pharmacy, diſtinguiſh potions into cathartic, cardiac, and alterative. See the articles CATHARTICS, &c.

POTOSI, a city of Peru in South America, ſituated at the bottom of a mountain of that name, in which is the richeſt ſilver-mine ever diſcovered: weſt long. 67°, ſouth lat. 22°.

POTTERY, the manufacture of earthen ware, or the art of making earthen veſſels.

The wheel and lathe are the chief, and almoſt the only inſtruments uſed in pottery: the firſt for large works, and the laſt for ſmall. The potters-wheel conſiſts principally in the nut, which is a beam or axis, whoſe foot or pivot plays perpendicularly on a free-ſtone ſole or bottom. From the four corners of this beam, which does not exceed two feet in height, ariſe four iron-bars, called the ſpokes of the wheel; which forming diagonal lines with the beam, deſcend, and are faſtened at bottom to the edges of a ſtrong wooden circle, four feet in diameter, perfectly like the felloes of a coach-wheel, except that it has neither axis nor radii, and is only joined to the beam, which ſerves it as an axis by the iron-bars. The top of the nut is flat, of a circular figure, and a foot in diameter: and on this is laid the clay which is to be turned and faſhioned. The wheel, thus diſpoſed, is encompaſſed with four ſides of four different pieces of wood faſtened on a wooden frame; the hind-piece, which is that on which the workman ſits, is made a little inclining towards the wheel; on the fore-piece are placed the prepared earth; on the ſide-pieces he reſts his feet, and theſe are made inclining, to give him more or leſs room. Having prepared the earth, the potter lays a round piece of it on the circular head of the nut, and ſitting down turns the wheel with his feet till it has got the proper velocity; then, wetting his hands with water, he preſſes his fiſt or his fingers-ends into the middle of the lump, and thus forms the cavity of the veſſel, continuing to widen it from the middle; and thus turning the inſide into form with one hand, while he proportions the outſide with the other, the wheel conſtantly turning all the while, and he wetting his hands from time to time. When the veſſel is too thick, he uſes a flat pieces of iron, ſomewhat ſharp on the edge, to pare off what is redundant; and when it is finiſhed, it is taken off from the circular head, by a wire paſſed underneath the veſſel.

The potters lathe is alſo a kind of wheel, but more ſimple and ſlight than the former; its three chief members are an iron-beam or axis three feet and a half high, and two feet and a half diameter, placed horizontally at the top of the beam, and ſerving to form the veſſel upon: and another larger wooden wheel, all of a piece, three inches thick, and two or three feet broad, faſtened to the ſame beam at the bottom, and parallel to the horizon. The beam or axis turns by a pivot at the bottom in an iron-ſtand. The workman gives the motion to the lathe with his feet, by puſhing the great wheel alternately with each foot, and giving it a greater or leſſer degree of motion.

tion, as his work requires. They work with the lathe, with the ſame inſtruments, and after the ſame manner as with the wheel. The mouldings are formed by holding a piece of wood or iron cut in the form of the moulding to the veſſel, while the wheel is turning round; but the feet and handles are made by themſelves and ſet on with the hand; and if there be any ſculpture in the work, it is uſually done in wooden moulds, and ſtuck on piece by piece on the outſide of the veſſel. For the glazing of the work, ſee GLAZING.

For the chineſe POTTERY, ſee the article PORCELAIN.

POTTLE, an engliſh meaſure containing two quarts. See MEASURE.

POTTON, a market-town, ten miles eaſt of Bedford.

POULTICE, or POULTIS, a form of medicine alſo called a cataplaſm. See the article CATAPLASM.

POULTRY, all kinds of domeſtic birds brought up in yards, as cocks, hens, capons, ducks, turkeys, &c. For the method of producing theſe from eggs, without the aſſiſtance of the parent-bird, ſee the article HATCHING.

POUNCE, gum ſandaric pounded and ſifted very fine, to rub on paper, in order to preſerve it from ſinking, and to make it more fit to write upon.

POUNCE is alſo a little heap of charcoal duſt, incloſed in a piece of muſlin or ſome other open ſtuff, to be paſſed over holes pricked in a work, in order to mark the lines or deſigns thereof on paper, ſilk, &c. placed underneath; which are to be afterwards finiſhed with a pen and ink, a needle, or the like. This kind of pounce is much uſed by embroiderers, to tranſfer their patterns upon ſtuffs; by lace-makers, and ſometimes alſo by engravers.

POUNCES, in falconry, the talons or claws of a bird of prey. See FALCONRY.

POUND, *libra*, a ſtanding weight, for the proportion and ſubdiviſions of which, ſee the article WEIGHT.

POUND alſo denotes a money of account; ſo called, becauſe the antient pound of ſilver weighed a pound troy. See the article MONEY.

POUND, among lawyers, denotes a place of ſtrength, in which to keep cattle that are diſtrained, or put in for treſpaſs, until they are replevied or redeemed.

A pound overt, or open pound, is built on the lord's waſte, and the owner of the cattle may reſort thither to give them meat; whereas a pound covert, or cloſe pound, is one to which the owner cannot come to feed his cattle, without giving offence, as the diſtrainer's houſe, &c.

There is this difference between an open pound, and a cloſe one; that no notice is neceſſary to be given to the owner to feed them, when confined in an open or common pound; but when the cattle are impounded in a cloſe pound, the deſtrainer is to feed them at his peril.

A common pound is kept in every townſhip, lordſhip, or village; and it is ſaid, there ought to be the like in every pariſh, the want whereof is puniſhable in a court-leet.

Pound-breach is where a diſtreſs being impounded, the owner breaks the pound; in which caſe, whether the diſtreſs were juſt or not, the party diſtraining may have his action on the caſe by ſtatute, and alſo retake the diſtreſs wherever he can find it.

POUNDAGE, a ſubſidy of 12 d. in the pound, granted to the crown on all goods and merchandizes exported or imported; and if by aliens, one penny more.

POUP, or POOP, in a ſhip. See the articles POOP and SHIP.

POURPRESTURE, in law, is a wrongful incloſure, or encroachment upon another perſon's property.

POURSELUC, a city of the kingdom of Siam: eaſt long. 100°, north lat. 28°.

POURSUIVANT, or PURSUIVANT, in heraldry, the loweſt order of officers at arms. See COLLEGE and HERALD.

The pourſuivants are properly attendants on the heralds, when they marſhal public ceremonies. Of theſe in England, there were formerly many; but at preſent are only four, *viz.* blue-mantle, rouge-croſs, rouge-dragon, and portcullice. In Scotland, there is only one king at arms; who is ſtiled lion, and has no leſs than ſix heralds, and as many purſuivants, and a great many meſſengers at arms, under him.

POURTRAIT, or PORTRAIT. See the article PORTRAIT.

POURVEYANCE, or PURVEYANCE, in law, the providing corn, fuel, victuals, &c. for the king's houſhold; and hence, the officer, who did ſo, was termed pourveyor.

As ſeveral offences were committed by theſe officers, it was enacted by ſtat. 12

Car. II. that no perſon under colour of purveyance, ſhall take any timber, cattle, corn, &c. from any ſubject without his free conſent, or without a juſt appraiſement, and paying for the ſame.

POUTING, a fiſh of the gadus-kind, with thirty rays in the fin beſide the anus.

POWDER, *pulvis*, in pharmacy, a dry medicine well broken, either in a mortar, by grinding, or by chemical operations. See the articles PULVIS and PULVERIZATION.

The jeſuits powder is nothing but the quinquina, or peruvian bark reduced to powder. See QUINQUINA.

There are various other powders uſed in pharmacy, chemiſtry, &c. as algarot or emetic powder, cornachine powder, flux-powder, gun-powder, &c. See the articles ALGAROT, CORNACHINE, &c.

The powder of Haly, *pulvis Hali*, is a compound powder made of poppy-ſeeds, ten drams; of ſtarch, gum arabic, and tragacanth, each three drams; of the ſeeds of purſlain, marſhmallows, and mallows, each four drams; of cucumber, melon, gourd, citrul, and quince-ſeed, cleanſed, each ſeven drams; of liquorice, three drams; of white amber, two drams; and of ſugar-candy, the weight of the whole: make them all into a powder.

As this powder is apt to grow rancid, if long kept, it is much better in the form of lozenges. See LOZENGE.

It is intended as an emollient, and to ſoften and heal internal injuries; as diſorders of the breaſt, lungs and kidneys, ſpitting of blood, &c. It alſo cools the heat of urine in gonorrhœas and ſtranguries; its doſe being from half a dram to two drams.

A cephalic powder, as a ſternutatory, may be made of the leaves of aſarabacca, marjoram, and the lilies of the valley, each any quantity at pleaſure.

The various kinds of powders mentioned in books of pharmacy, being endleſs, we ſhall only give the form of a powder againſt miſcarriages: take red roſe leaves, maſtich, aloes-wood, pearls, red coral, of each a ſcruple; ſpikenard, mace, cinnamon, yellow ſaunders, cardamoms, and white amber, of each half a dram: reduce all to a powder. It is directed either in powder, from a ſcruple to a dram at a time, in red wine; or to be made into lozenges with their whole weight of ſugar, and a mucilage of tragacanth.

The beſt powder for the hair is ſtarch well pounded and ſifted, and generally prepared with ſome perfume.

POWDERINGS, among builders, certain devices, ſerving to fill up vacant places in carved work.

POWER, *potentia*, in phyſiology, the faculty of doing or ſuffering any thing.

Power therefore is two-fold, *viz.* conſidered as able to make, or able to receive any change, the former whereof may be called active power, and the latter paſſive power. Of paſſive power, all ſenſible things abundantly furniſh us with ideas, whoſe ſenſible qualities and beings we find to be in a continual flux, and therefore we look on them as liable to the ſame changes. Nor have we fewer inſtances of active power; ſince whatever change is obſerved, the mind muſt collect a power ſomewhere able to effect it; but, eſpecially, by reflecting on the operations of our own minds, as the power of perception, of volition, &c. See the articles FREEDOM, WILL, PERCEPTION, &c.

Dr. Keil demonſtrates that the phyſical power, or action of bodies, propagated in orbem: as light, heat, odour, &c. has its efficacy increaſed or diminiſhed in a duplicate ratio of the diſtances from the center of radiation, or exertion of that power.

Thus, let A (plate CCX. fig. 1.) be a center from whence any power is exerted all round, according to the right lines A*e*, A*f*, A*g*, &c. the efficacy of this power will be at equal diſtances from A, as the ſpiſſitude or denſity of the rays A*b*, A*c*, A*d*, &c. But the rays within the inner circle, or rather ſpherical ſuperficies, *bcd*H, when they come to be extended to the other ſpherical ſurfaces, *efg*K, will be much leſs cloſe than before, *viz.* in the reciprocal proportion of the ſpaces they take up: and ſince ſpherical ſuperficies are as the ſquares of their radii, therefore the efficacy of the power, in the inner ſurface, will be to that in the outer, as Ae^2 to Ab^2. Q. E. D.

POWER, in mechanics, denotes any force, whether of a man, a horſe, a ſpring, the wind, water, &c. which being applied to a machine, tends to produce motion. See the articles MACHINE and ENGINE.

The intenſity of a power is its abſolute force; that is, its force, ſuppoſing its velocity equal to its weight: for its moving or acting force may be greater or leſs, according as its velocity is increaſed

or diminiſhed, in reſpect of that of the weight. As for example, if a man be the power, and can raiſe from the ground a certain weight, that weight will expreſs or be equal to the intenſity of the power; for in this caſe, whatever engine be made uſe of, that part of the engine, where the weight is duly applied, will move juſt as faſt as that on which a man acts with his whole force.

A power may act in any direction whatever; but a weight has only one direction, *viz.* towards the center of the earth. See GRAVITATION.

When we ſpeak of the mechanical powers, the word power is taken in a very different ſenſe from that above laid down; ſince, in this caſe, it ſignifies only an organ or inſtrument, whereby a power of a known intenſity is made to act upon a weight: and therefore we muſt take care not to attribute any real force to any ſimple or compound machine, as many are apt to do merely becauſe the name power has been given to mechanical organs, not from their effect, but from the effect which the power produces by their means. For how much ſoever the force of a power is thereby increaſed, in order to ſuſtain or raiſe a weight far ſuperior to it in intenſity; yet this cannot be done without loſing in ſpace and time what is gained in force; contrary to what ſome have vainly imagined, becauſe the vulgar commonly ſpeak of a machine as they do of an animal; attributing that effect to the machine, which is only the effect of the power by means of the machine: thus, it is uſual to ſay, ſuch a machine raiſes ſuch a quantity of water, or performs ſuch and ſuch work; when we ſhould ſay, if we would ſpeak philoſophically, ſuch a running ſtream, ſuch a fall of water, the wind, or ſo many men, horſes, oxen, &c. raiſe ſo much water in ſuch a time, &c. by means of ſuch or ſuch a machine. It were therefore to be wiſhed, that the word power were to be confined to its proper ſenſe, and not uſed to ſignify one of the mechanical organs; however, as it has been cuſtomary to uſe it in that ſenſe, we have done ſo too, but withal thought proper to give the above caution.

The ſimple mechanical organs or powers are the lever, ballance, axis in peritrochio, pulley, ſcrew, wedge, and inclined plane. See the articles LEVER, BALLANCE, &c.

POWER, in law, ſignifies in general, a particular authority, granted by any perſon to another to repreſent him, or act in his ſtead. It is ſometimes alſo uſed for a reſervation in a conveyance, for the granter or grantee to do certain acts; as to make a jointure, to grant leaſes, &c. It is held, that the difference between a bare power and ſuch as ariſes from an intereſt, conſiſts in this, that a woman who has the former to ſell lands, &c. may do it notwithſtanding ſhe marries; but where it is by reſervation in a deed of ſettlement, ſhe muſt execute it according to the power at the time it was firſt reſerved.

For the power of the county, ſee the article POSSE COMITATUS.

In the feodal juriſprudence, the lord has a right to reunite to his fief, a dependent fee held of him, when the vaſſal has aliened the ſame; but then he muſt exerciſe this power within a year after he has notice of its fall, otherwiſe he loſes it.

POWERS, POTENTIÆ, likewiſe denote the ſixth order in the hierarchy of angels. See the article HIERARCHY.

POWERS, in arithmetic and algebra, are nothing but the products ariſing from the continual multiplication of a number, or quantity, into itſelf: thus, 2, 4, 8, 16, 32, &c. are the powers of the number 2; and a, a^2, a^3, a^4, &c. the powers of the quantity a; which operation is called involution. See the articles INVOLUTION and BINOMIAL.

Powers of the ſame quantity are multiplied by only adding their exponents, and making their ſum the exponent of the product: thus, $a^4 \times a^5 = a^{4+5} = a^9$.

Again, the rule for dividing powers of the ſame quantity, is to ſubtract the exponents, and make the difference the exponent of the quotient: thus, $\frac{a^6}{a^4} = a^{6-4} = a^2$. See the article EXPONENT.

Negative powers, as well as poſitive, are multiplied by adding, and divided by ſubtracting their exponents, as above. And, in general, any poſitive power of a, multiplied by a negative power of a, of an equal exponent, gives unit for the product; for the poſitive and negative deſtroy each other, and the product is a^0, which is equal to unit. Likewiſe, $a^{-5} = a^{-5+2} = a^{-3} = \frac{1}{a^3}$; and $\frac{a^{-2}}{a^{-5}} = a^{-2+5} = a^3 = \frac{1}{a^{-3}}$. And, in general, any quantity placed in the denomina-

minator of a fraction, may be transposed to the numerator, if the sign of its exponent be changed: thus, $\frac{1}{a^3} = a^{-3}$, and $\frac{1}{a^{-3}} = a^3$.

The quantity a^m expresses any power of a, in general; the exponent m being undetermined: and a^{-m} expresses $\frac{1}{a^m}$, or a negative power of a, of an equal exponent: and $a^m \times a^{-m} = a^{m-m} = a^0 = 1$. Again, a^n expresses any other power of a; and $a^m \times a^n = a^{m+n}$, and $\frac{a^m}{a^n} = a^{m-n}$.

To raise any simple quantity to its second, third, or fourth power, is to add its exponent twice, thrice, or four times to itself; so that the second power of any quantity is had by doubling its exponent; and the third, by tripling its exponent; and, in general, the power expressed by m, of any quantity, is had by multiplying the exponent by m: thus the second power, or square of a, is $a^{2\times1} = a^2$; its third power, $a^{3\times1} = a^3$; and the mth power of a, is $a^{m\times1} = a^m$. Also the square of a^4, is $a^{2\times4} = a^8$; the cube of a^4, is $a^{3\times4} = a^{12}$; and the mth power of a^4, is $a^{4\times m}$. The square of abc, is $a^2 b^2 c^2$; its cube $a^3 b^3 c^3$; and the mth power, $a^m b^m c^m$.

POWER *of an hyperbola*, in conics, is the sixteenth part of the square of the conjugate axis; or the fourth part of the square of the semi-conjugate axis. See the article HYPERBOLA.

POX, or SMALL POX, *variolæ*, in medicine, a contagious disease appearing on the surface of the skin, which it covers with pustules, or ulcerous eruptions, that frequently leave scars behind them.

The small pox is commonly divided into two kinds, the distinct and the confluent. The distinct or regular sort, according to Sydenham, begins with a shuddering and chilness, which is succeeded by an intense heat, violent pain of the head and back, vomiting, drowsiness, and sometimes epileptic fits, especially in children, which shew the pox to be ready to burst forth, and that they will be mild. The eruptions are usually on the fourth day from the beginning, at which time the feverish symptoms either abate, or wholly disappear. The spots are at first reddish, and spread themselves over the neck, breast, and the whole body. On the eighth day the spaces between the pustules which were hitherto white, begin to grow red, and swell, the eye-lids are puffed up, and close the eyes; next to the face, the hands begin to swell; and the pustules of the face, before smooth and red, begin to be rough and whitish, and throw out a yellowish matter. On the eleventh day, the swelling of the face and inflammation disappear; and the pustules being ripe, grow dry and fall off: and on the fourteenth or fifteenth day, perish entirely. In the confluent sorts there are the same symptoms, but more violent; and as the disease increases, the eruptions do not arise to any considerable height: this sort is attended with spitting in adults, and generally with a looseness in children.

But though most authors, as we have already observed, divide the small pox into the distinct and confluent sorts; Dr. Mead thinks it more accurate, and agreeable to the nature of the disease, to divide it into simple and malignant. The simple sort is that in which the eruption is attended with a slight fever of short duration, the pustules fill kindly, make good matter in a few days, and at last fall off in dry scabs. The malignant sort is that in which the eruption is attended with a malignant fever, the pustules hardly come to any tolerable degree of maturity, and either suppurate not at all, or if they do in some measure, they are with difficulty brought to end in little crusts. The malignity appearing in various forms, has given various appellations to this disease, as the crystalline, the warty, and the bloody. The pustules of the crystalline sort, instead of a thick well-digested matter, contain nothing but a thin pale water, and are in some measure pellucid. And this sort is sometimes observed in the distinct as well as the confluent; sometimes this fluid flies off, and leaves hollow bladders. The warty pustules contain no fluid, but grow hard and prominent above the skin, like warts: these are peculiar to the distinct sort. The bloody pustules are produced more ways than one; for sometimes, at the very beginning of the disease, the pustules are small tubercles full of blackish blood, as if the skin was pinched with a forceps; then purple and livid spots follow, as in the true plague: but it more frequently happens,

pens, that the puſtules coming out very thick, on the third or fourth day after, when they ought to fill, become livid and a little bloody, with black ſpots ſpread over the whole body, which forebode death in a day or two, theſe being real gangrenes. It very often falls out at this time, that a thin blood flows not only out of the patient's mouth, noſe, and eyes, but alſo by every outlet of the body, but more eſpecially by the urinary paſſages, as it does ſometimes on the firſt days of the diſtemper: theſe are manifeſtly of the confluent kind.

In the management of the patient, in the diſtinct ſort, it is a general rule, ſays Dr. Mead, to keep the patient in bed during the firſt days of the diſtemper, but neither to ſtifle him by heat and cloaths, nor to check the perſpiration by cold; yet care ought to be taken to ſupply him with pure and cool air. With regard to diet, it ought to be very ſlender, moiſtening and cooling, ſuch as oatmeal or barley gruel; and in the beginning, the beſt regimen is that which keeps the body open, and promotes urine: this end is obtained by boiling preſerved fruit with their food, and giving them ſubacid liquors for drink, as ſmall beer acidulated with orange or lemon-juice, whey turned with apples boiled in milk, &c.

In the cure, Sydenham adviſes bleeding on any of the three firſt days, and then an ounce or an ounce and an half of emetic wine. Mead alſo, in the firſt place, adviſes bleeding even to children, and affirms that when they are ſeized with convulſions at the onſet of the diſeaſe, ſome evacuation ought to be made, which may be ſafely done by leeches applied to the temples, or behind the ears, and that in moſt young ſubjects, if blood cannot be drawn from the arm, either of the jugulars may be opened. In youths and adults, he ſays, it is often neceſſary to take away blood two or three times, only with an intermiſſion of two or three days between each time; for blood-letting is ſo far from being an obſtacle to the eruption of the puſtules, if the patient is not too weak, that it forwards it conſiderably. He adds, that after bleeding, a vomit ſhould be given, if the ſtomach abound with phlegm or bile, or be loaded with food unſeaſonably taken: otherwiſe a purge may be preſcribed before the eruption of the puſtules, which may be the infuſion of ſena with manna, or manna alone, eſpecially for children. To keep the inflammation of the blood within due bounds, and to aſſiſt the expulſion of the morbific matter through the ſkin, take half an ounce of bezoardic powder, and two drams of purified nitre; mix theſe powders: half a dram of this mixture may be taken by an adult three or four times in a day; diminiſhing the quantity for children according to their age. Sometimes equal quantities of theſe ingredients may be preſcribed; and if the effervеſcence of the fever runs very high, a proper quantity of the ſpirit of vitriol may be added to the patient's drink. When the eruption of the puſtules is completed, an adult patient may take about fourteen drops of liquid laudanum, or an ounce of ſyrup of white poppies, in a little cowſlip-flower-water, every night. But opiates are improper for children.

If this method is proper in the diſtinct ſmall pox, it will be found more neceſſary in the confluent. In the cryſtalline ſort, the water of the puſtules can never be brought to a laudable ſuppuration; therefore, while the thinner parts are made to tranſpire through the ſkin, the groſſer ought to be drawn off through the urinary paſſages. To this purpoſe nitre may be adminiſtered three or four times a day, from a ſcruple to half a dram, in ſmall wine; and while nitre is thus taken, it will be proper to interpoſe medicines which cheriſh the heart, and promote the flux of the humours into the puſtules, as the cordial confection, or the bezoardic powder, ſometimes with a little ſaffron. Beſides, on the fifth or ſixth day, bliſters are to be applied between the ſhoulders, and to the arms and legs; for which purpoſe the bliſtering epithem is moſt convenient. In the warty ſmall pox, which is more dangerous than the cryſtalline, the utmoſt endeavours are to be uſed to take off the fever, and to provoke a ſweat, in order to digeſt the morbid humour, by the cordial medicines abovementioned; and, in this caſe, bliſters are likewiſe to be applied. The bloody ſmall pox requires peculiar attention; and Mead obſerves, that if there be any room for phyſic, thoſe medicines bid faireſt for ſucceſs, which tend to thicken the blood: the beſt of this kind are the peruvian bark, alum, and oil of vitriol; which are beſt uſed alternately in this manner, a dram of the bark may be given every ſixth hour, and three hours after a proper quantity of alum; which will be a powerful medicine, if thus compound-

ed,

ed, melt three parts of alum with one part of dragon's blood, over the fire; and when the mass is grown cold, reduce it to a powder: a scruple of this, made into a bolus with oil of roses, will be a proper dose. The most convenient manner of giving the oil of vitriol, is in the tincture of roses; of which tincture five or six spoonfuls may be taken four or five times a day. In every sort of this disease, it is proper to open the body on the decline, that is, on the ninth or tenth day from the eruption; because a putrid fever generally comes on about that time, while the pustules are drying; or upon the subsiding of the swelling of the inflamed skin, where there is no suppuration; gentle cathartics are the safest means of removing this fever, and such as were directed before the eruption: but if any purulent matter should still lurk under the withered skin of the pustules, the body is not yet to be purged, but rather to be supported by the proper diet, till the matter is all come away.

French POX, *lues venerea*, is defined a malignant and putredinous dyscrasy of all the humours, but especially of the serum and lymph, arising from a venereal taint received into the body; or, according to Sydenham, when a gonorrhœa has continued a long while, or long enough for the poisonous matter to make its way into the blood; or by astringents given unseasonably, it cannot make its exit, then the patient is infected with the french pox. See the article GONORRHOEA.

The buboes in the groin constitute the first degree of this distemper: then follow pains of the head, joints, of the shoulders, arms, and ancles, coming on by fits, but at no certain intervals, unless in the night, when the patient is warm in bed. See the article BUBO.

There are also scabs and scurfs in various parts of the body, which are as yellow as a honeycomb; sometimes they have large surfaces, answering the description which authors give of the leprosy. All these symptoms gradually increase, especially the pain, which becomes so intense that the patient is unable to lie in bed. Afterwards, nodes or exostoses arise in the skull, shin-bones, and bones of the arms, which being attended with constant pain and inflammation, at length grow carious and putrefied. Phagedenic ulcers likewise seize various parts of the body, but generally first begin with the throat, and from thence gradually creep by the palate to the cartilage of the nose, which they destroy, and the nose being destitute of its prop, falls down flat. The ulcers and pains daily increasing, the patient sinks under the torment, and one member rotting away after another, is hurried into his grave.

Besides these already mentioned by Sydenham, Astruc enumerates a large catalogue of symptoms that afflict the skin, the mouth, the throat, uvula, tonsils, the bones, the lymph, the lymphatic glands and vessels, the eyes, ears, &c. See the articles SERPIGO, HERPES, CARIES, APHTHÆ, EXOSTOSIS, GANGLION, &c.

Women afflicted with this distemper, have disorders proper to the sex, as cancers in the breast, a suppression or overflowing of the menses, the whites, the hysteric passion, an inflammation, abscess, schirrus, gangrene, ulcer, and cancer of the womb: they are either barren, or subject to abortion, or the children they bring into the world have an universal erysipelas, half rotten, and covered with ulcers. See the articles MENSES, WHITES, HYSTERIC PASSION, &c.

The methods of curing the french pox are principally four: 1. The common one, by salivation. 2. By giving quicksilver-pills. 3. By mercurial frictions, which are to be purged off before a salivation is raised. And, 4. By sweating with a decoction of guaiacum. For the first, of these methods, see SALIVATION.

The second method of curing the french pox is by a quicksilver-pill. This was brought into reputation by Belloste; and tho' he has kept the composition a secret, yet there is no reason to doubt but it is quicksilver mixed with a certain proportion of cathartic. Turner's imitation of this pill is as follows: take of quicksilver two drams; turpentine, and pill of calocynth with aloes, of each half a dram; of which make twelve pills. The quicksilver must be well incorporated with the turpentine till it becomes invisible; and then the pill of calocynth with aloes is to be added: sometimes it will require a little crab's eyes, to give it a consistence. If one of these pills be taken night and morning after the two first days, it will give two or three stools a day, without gripes or sickness. It may be proper, either night or morning, after the pill, to sweat the patient with a pint of the strong decoc-

tion

ſion of guaiacum, drank hot upon it. In the middle ſpecies of this diſeaſe, the patient is directed to obſerve no particular regimen, but may go about his affairs as uſual. This method of cure, as is allowed may be preſcribed to very good purpoſe, in this ſtubborn diſeaſe; but it is not thought ſo effectual as ſalivation, without which, Turner is of opinion, that exoſtoſes and carious tophi cannot be cured.

The third method of curing the french pox, is by mercurial frictions, which Deſault gives as follows: when the patient has a pox of a long continuance, and the venereal poiſon is diſperſed all over the body, he ſhould be prepared by bathing and drinking whey. But in a recent pox the bath is not neceſſary. After this, inſtead of raiſing a ſalivation, he brings on a flux of the belly, by means of clyſters of a decoction of ſenna and the pulp of caſſia, before the frictions are adminiſtered. When he finds that the looſeneſs does not anſwer the number of frictions, nor the quantity of mercury made uſe of, he purges the patient with powder of jalap, and procures copious ſtools. While the looſeneſs is going on, the friction does the office of a purge; and in proportion as they are repeated, the flux of the belly revives; and when it ſlackens or ſtops, he has recourſe to the clyſters and purges of jalap. He purſues this method till the ſymptoms ceaſe, and till he is perſuaded, by the abundance of the evacuations, the venereal poiſon is entirely drained off. By this means he carries off the pox and gonorrhœa at once. Dr. Douglas not only approved, but uſed this method with ſucceſs. The frictions are to be made with mercurial ointment, and one third of quickſilver, from two or three drams to an ounce or an ounce and a half, every night or every other night.

The fourth and laſt method of curing this diſtemper, is with ſtrong decoctions of guaiacum. This we have the firſt account of, from Sir Ulric Hutten, who purſued it himſelf. A pound of guaiacum is to be boiled in a gallon of ſpring-water, to one half, and the ſcum reſerved to anoint the ſores; and a ſecond decoction is to be uſed for common drink. Boerhaave, who recommends this method, ſuppoſes that a ſalivation will be ineffectual, if every drop of fat in the blood is not melted down into water, and carried off; and the patient reduced to a death-like paleneſs. He likewiſe ſuppoſes, that guaiacum performs its taſk by reſolving all the unctuous particles, whether incorporated in the maſs of blood, or accumulated in their proper repoſitories; and by emaciating the habit ſo exquiſitely, as not to leave one drop of oil therein. He directs the patient to keep in a room of ſuch a warmth, as that its mere heat will incline him to ſweat: he adviſes alſo, through the whole courſe of the cure, to abſtain from every thing that has the leaſt oilineſs in its nature, eating nothing but ſea-biſcuits and raiſins, and drinking only a weaker decoction of guaiacum. He muſt alſo drink eight ounces every day of the ſtrong decoction, the more the better, till ſome days his habit is bloated with it, as if he had the dropſy. After this let the patient every morning drink faſting as much of the decoction as his ſtomach will hold, and place himſelf in an erect poſture in a ſweating-box; or if he lies a-bed, let a ſtove be put under it. In either place he muſt receive on his naked body the ſteam of kindled ſpirits of wine, and there let him ſweat as long and as plentiful as his ſtrength will allow. After he has ſuffered this heat for half an hour, let the flame be extinguiſhed and the patient ſweat in his bed, about half an hour longer. After which let him take eight or ten ounces of veal-broth boiled in a ſmall quantity of rice, but void of fat. His body muſt now be carefully wiped with warm dry flannel, after which let him riſe and drink of his decoction, as formerly throughout the day. This muſt be done morning and evening in every article, for fourteen days ſucceſſively; after this, in the morning fourteen days more.

PRACTICE, in arithmetic, or rules of practice, are certain compendious ways of working the rule of proportion, or golden-rule. See RULE of THREE.

Caſe I. When a queſtion in the rule of three being duly ſtated, and the extremes are ſimple numbers of one name; whether the middle term be ſimple or mixt; if the extreme, which by the general rule is the diviſor, be 1, and the middle term, an aliquot part, of ſome ſuperior ſpecies; then divide the other extreme by the denominator of that aliquot part, the quote is the anſwer in that ſuperior ſpecies; and if there is any remainder, it muſt be reduced, and its value found.

Example 1. What is the price of 67 yards of cloth at 5s. per yard? The ſtate of the proportion is, as 1 yd. : 5s. :: 67; and becauſe the diviſor is 1 yd. and the middle term 5s. which is a fourth part of one pound. Therefore divide 67 yds. by 4, the quote is 16l. and 3 remains, which reduced to ſhillings, and divided by 4, quotes 15s.

The reaſon of this practice is obvious; for if 1 yd. coſt ¼ of 1l. 67 yds. muſt coſt 67 ¼th parts, or, which is the ſame thing, the fourth part of 67l.

Example 2. The value of 54 ſtone weight, at 10s. (= ½ of 1l.) per ſtone, is 27l. equal ½ of 54.

Caſe II. If the price of an unit is an even number of ſhillings, multiply the other extreme (of the ſame name with the unit) by the half of that number; double the firſt figure of the product for ſhillings, and the remaining figures to the left, are pounds in the anſwer.

Example 1. What is the value of 324 yds. at 6s. per yard?

Multiplying 324 by 3 (the ½ of 6) the product is 972, which according to the rule, is 97l. 4s. which is the anſwer. And it is very eaſy to ſet down the ſhillings and pounds ſeparately, without writing firſt down the total product, and then ſeparating them.

The reaſon of this practice is, that if we multiply the whole even number of ſhillings, the product is the anſwer in ſhillings; which divided by 20, reduces it to pounds, the remainder being ſhillings: but if we multiply only the half of theſe ſhillings, the product is only the half of the value in ſhillings. Now ſuppoſe we multiply this product by 2, to give the whole number of ſhillings, and divide this laſt product by 20, to reduce them to pounds; then, becauſe 20 is two times 10, it is plain that the product made by the half of the given price, being firſt multiplied by 2, and this product divided by 20 (or, which is the ſame thing, firſt by 2, and the quote by 10) the laſt quote will be the ſame as if that firſt product were only divided by 10; becauſe to multiply by 2, and then divide the product by 2, brings back the ſame number that was multiplied: wherefore it is plain, that if the firſt product is divided by 10, the quote is the anſwer in pounds and tenth parts; and, becauſe the diviſor is 10, therefore the integral quote, or pounds, are expreſſed by the dividend, excluding the firſt figure on the right hand; and becauſe that figure is the number of tenth parts, therefore the double of it is the number of twentieth parts, that is, of ſhillings, and thus every part of the rule is clear.

Obſerve; if the price of one unit conſiſts of pounds and ſhillings, whoſe half reduced to ſhillings is a number by which we can eaſily multiply, ſo as to bring out the product in one line at the firſt ſtep, as we may if that half doth not exceed 29, then we alſo uſe the above method.

Example. What is the price of 467 yds. at 1l. 14s. per yard? Here 1l. 14s. is 34s. whoſe half is 17, by which multiplying 467, according to the rule, the anſwer is 793l. 18s.

Caſe III. If the middle term is not an aliquot part of ſome ſuperior integer, (the diviſor being always 1) yet it may be equal to the ſum of ſeveral aliquot parts; and then if you divide by the denominators of each of theſe ſeparately, and add all the quotes, the ſame is the anſwer required.

Example. If 1 yd. coſt 15s. what coſt 49 yards? Anſwer 36l. 15s. found thus: 15s. is 10s. and 5s. viz. the ½ and ¼ of 1l. ſo I take the ½ of 49l. which is 24l. 10s. and ¼, which is 12l. 5s. whoſe ſum is 36l. 15s.

The reaſon of this is plain, but it is to be obſerved, that in moſt caſes where the middle term is not an aliquot part, the common rule by reduction is eaſier.

Caſe IV. If the middle term is ſo mixed as to have in it any number of the higheſt ſpecies, firſt multiply the number, and then the other parts by ſome of the former caſes, if poſſible, and if this cannot be done, or not without much working; then the common method of reduction is to be taken.

Example 1. If 1 yd. coſt 4l. 6s. 8d. what coſt 734 yards? Anſwer 3180l. 13s. 4d. for 4l. multiplied by 734, produces 2936l. and for 6s. 8d. which is the ⅓ of 1l. you muſt take the ⅓ of 734, which is 244l. 13s. 4d. and the ſum of both is 3180l. 13s. 4d.

Example 2. Suppoſe the price of 1 yd. 3l. 7s. 9d. then no method by aliquot parts is ſo eaſy as the common method by reduction.

Caſe V. If the extreme which is the multiplier is an aliquot part, or the ſum of certain aliquot parts, of the unit which

which is diviſor, then take by diviſion ſuch part or parts of the middle term, (whether this be a ſimple, or mixed number,) and if the multiplier has alſo ſome number of the ſame ſpecies with the unit, you muſt work for that number ſeparately by ſome of the former caſes, or the common rule; then add all the parts, which is the anſwer.

Example 1. If 1 pound weight coſt 32 l. what coſt 4 ounces? Anſwer 8 l. *viz.* $\frac{1}{4}$ of 32 l. becauſe 4 ounces are $\frac{1}{4}$ of 1 lb.

Example 2. If 1 l. buy 3 hund. weight 1 qr. 7 lb. how much will 28 l. 5 s. 6 d. buy? Anſwer 93 ct. 2 qrs. 18 lb. $\frac{4}{10}$ oz. which is found thus; firſt for the 28 l. multiply 3 ct. by it, which gives 84 ct; then for 1 qr. take $\frac{1}{4}$ of 28, is 7 ct. and for 7 lb. take $\frac{1}{10}$ of 28, is 1 ct. 3 qrs. or, which is the ſame thing, take $\frac{1}{4}$ of 7 ct. becauſe 7 lb. is $\frac{1}{4}$ of 1 qr. ſo the total for 28 l. is 92 ct. 3 qrs. for 5 s. which is $\frac{1}{4}$ of 1 l. take $\frac{1}{4}$ of 3 ct. 1 qr. 7 lb. it is 3 qr. 8 lb. 12 oz. and for 6 d. which is $\frac{1}{10}$ of 5 s. take $\frac{1}{10}$ of 3 qr. 8 lb. 12 oz. it is 9 lb. $\frac{4}{10}$ oz. ſo the total for 5 s. 6 d. is 3 qr. 18 lb. $\frac{4}{10}$ oz. and to this adding 92 ct. 3 qr. the ſum is 93 ct. 2 qr. 18 lb. $\frac{4}{10}$ oz.

The work.	ct.	qr.	lb.		ct.	qr.	lb.	oz.
	3	1	7	4	3	1	7	00
	28			10				
						3	8	12
	84						9	04 $\frac{4}{10}$
	7					3	18	00 $\frac{4}{10}$
	1	03			92	3	00	00
Sum	92	03			93	2	18	00 $\frac{4}{10}$

Note. If the multiplier and the middle term are both of the ſame kind of things, then we may conſider either as the multiplier, as ſhall be moſt convenient for the operation.

Example. If 1 l. gain 4 s. 6 d. how much is thereby gained upon 34 l. 10 s? Anſwer 7 l. 15 s. 3 d.

Which is found two ways, *viz.* Firſt multiply 4 s. 6 d. by 34 l. 10 s. thus; 4 s. by 34, makes 6 l. 16 s. and 6 d. by 34, makes 17 s. then 4 s. 6 d. by 10 d. or $\frac{1}{2}$, makes 2 s. 3 d. and the total is 7 l. 10 s. 3 d. Or ſecondly multiply 34 l. 10 s. by 4 s. 6 d. thus; 4 s. 6 d. is 2 s. and 2 s. 6 d. therefore 34 l. 10 s. multiplied by 2 s. or $\frac{1}{10}$, the product is 3 l. 9 s. then by 2 s. 6 d. or $\frac{1}{8}$, it is 4 l. 6 s. 3 d. and the total is, as before, 7 l. 15 s. 3 d. Thus,

l.	s.	d.		
	4	6	The product of	4 s. by 34
6	16			6 d. by 34
	17			4 s. 6 d. by $\frac{1}{2}$
	2	3		
7	15	3		

l.	s.	d.		
34	10		The product of 34 l. 10 s.	by 2 s. or $\frac{1}{10}$
3	9			by 2 s. 6 d. or $\frac{1}{8}$
4	6	3		
7	15	3		

These are the chief and fundamental practices by aliquot parts, which who ever underſtands, will eaſily find many particular abridgments depending upon the ſame principles.

PRÆ, a latin prepoſition, literally ſignifying *before*, and uſed in many words in our language, to denote the relation of priority; though they are often written with a common *e* inſtead of the *æ*; as præceſſion or preceſſion, prædeceſſor or predeceſſor, *&c.* See the articles PRECESSION, PREDECESSOR, *&c.*

PRAGMATIC SANCTION, in the civil law, is defined by Hottoman to be a reſcript, or anſwer of the ſovereign, delivered by advice of his council, to ſome college, order, or body of people, upon conſulting him on ſome caſe of their community. The like anſwer given to any particular perſon, is called ſimply reſcript. The term pragmatic ſanction, is chiefly applied to a ſettlement of Charles VI. emperor of Germany, who, in the year 1722, having no ſons, ſettled his hereditary dominions on his eldeſt daughter, the archdutcheſs Maria Thereſa, which was confirmed by the diet of the empire, and guaranteed by Great Britain, France, the States-General, and moſt of the powers in Europe.

PRAGMATICAL, a term uſed ſometimes in the ſame ſenſe as practical, mechanical or problematical.

PRAGUE, the capital of Bohemia, ſituated on the river Mulda, in eaſt long. 14° 20′ north lat. 50°. This is a ſtrong fine city, and, next to London, Paris, and Conſtantinople, the largeſt in Europe.

PRAMNION, in natural hiſtory, the name of a ſemi-pellucid gem, ſo diſtinct from all others, as to make a peculiar genus of foſſils.

This is a very ſingular ſtone, and of a very

very great concealed beauty: our lapidaries, when they meet with it, call it by the name of the black agate. It is of an extremely close, compact, and firm texture, of a smooth and equal surface, and in shape very irregular; being sometimes round, sometimes oblong, and often flat; in size it seldom exceeds two inches. It appears, on a common inspection, to be of a fine, deep black: but held up against the sun, or the light of a candle, it is an elegant red, clouded by a quantity of subtile black earth. We have it from the East-Indies.

PRASIUM, in botany, a genus of the didynamia gymnospermia class of plants, the corolla whereof consists of a single ringent petal; the upper lip is erect, roundish, absolutely emarginated, and concave; the under one is broader, reflex, and divided into three segments: the fruit consists of four roundish, unilocular berries, in the bottom of the cup: the seeds are roundish and solitary.

PRASIUS, PRASITES, in natural history, the name of a gem much approaching to the nature of the emerald, but wanting its hardness, and being of a coarser green, with an admixture of yellow. It is, even in its most perfect state, much less beautiful than most of the other gems, and is found of various sizes, but seldom smaller than a pea or larger than a nutmeg. It is also of various figures, but is never columnar; it is frequently of an orbicular form, flatted on one side and convex on the other, and often oblong or oval, but more usually it is of an irregular shape, made up of a number of flat faces. Its colour is a deep green, usually with a bluish cast, and always with a greater or less admixture of yellow.

PRATIQUE, or PRATTIC, in commerce, a negotiation, or communication, of commerce, which a merchant-vessel obtains in the port it arrives in, and the countries it discovers: hence to obtain a pratique, is to obtain a liberty to frequent a port, to go ashore, to buy and sell, &c.

Pratique is particularly used for a licence to traffic, granted to the master of a ship in the ports of Italy upon a bill of health; that is, a certificate that the place whence he came is not annoyed with any infectious disease.

PRATOLINO, a city of Tuscany, eight miles north of Florence, where the great duke has a palace and gardens, with some of the finest water-works in Italy.

PRAYER, in theology, a petition put up to God, either for the obtaining some future favour, or the returning of thanks for a past one.

With regard to prayer, Jesus Christ forbids his disciples to lengthen them by vain and impertinent repetitions. The Jews, antiently, when they went to pray, covered their head and face with a veil, as a mark of humility and confusion, when they appeared before the divine presence; the postures they used were either standing, according to the example of holy men recorded in Scripture, or bowing, kneeling, or prostrating. They always turned their faces towards the temple, if they dwelt at Jerusalem; and towards Judea, if they lived elsewhere. The duty of prayer is strongly enforced in the koran. The Turks are directed to pray five times every day. They kneel at prayers, laying their back parts on their heels. The old Lacedemonians had a peculiar form of prayer: for they never used, either in their public or private devotions, to make any other request than, that the gods would grant whatever was honourable and good for them: there were several ceremonies attending the manner of their supplicating the gods, and the postures they used were different; but the most common was kneeling.

Divines distinguish three kinds of prayer, vocal, which is cloathed in words and sounds, to be uttered by the mouth; mental, which is only formed or conceived in the mind, and not delivered in words; and ejaculatory, which is a short sudden flight, without study, order, or method. Among us prayer is most frequently considered under the divisions of preconceived and extemporary: under the first come all set forms, whether public or private, by which the mind is directed in the order, manner, expression, &c. of its petitions; the second is that where the mind is left to itself, and its own conduct, both as to matter, manner, words, &c. The Romanists prefer prayers to saints, the virgin, the angel Gabriel, &c. See the article SAINT, AVE-MARIA, &c.

PREACHING, in theology, the promulgation of the word of God in public; or the making a sermon, or public oration on some passage in the sacred Scriptures, in order to inform the judgment and mend the lives of the hearers.

PRE

PREADAMITE, a denomination given to the inhabitants of the earth who, according to ſome people, lived before Adam.

Iſaac de Pereyra, in 1655, publiſhed a book, in which he attempted to prove that the Jews alone were deſcended from Adam; and that the Gentiles, whom he called Preadamites, lived long before Adam: this book was anſwered by Demarets, profeſſor of theology at Groningen.

PREAMBLE, in law, the beginning of an act of parliament, *&c.* which ſerves to open the intent of the act, and the miſchiefs intended to be remedied by it.

PREBEND, the maintenance a prebendary receives out of the eſtate of a cathedral or collegiate church. Prebends are diſtinguiſhed into ſimple and dignitary; a ſimple prebend has no more than the revenue for its ſupport: but a prebend with dignity, has always a juriſdiction annexed to it.

Theological or *divinity* PREBEND, in France, is a prebend appropriated to a doctor of divinity in each cathedral and collegiate church, for preaching on Sundays, and making a public lecture thrice a week.

Preceptorial PREBEND, is a prebend whoſe revenues are deſtined for the ſupport of a preceptor or maſter, who is obliged to inſtruct the youth of the place gratis.

PREBENDARY, an eccleſiaſtic who enjoys a prebend.

The difference between a prebendary and a canon is, that the former receives his prebend, in conſideration of his officiating in the church; but the latter merely by his being received into the cathedral or college.

Golden PREBENDARY *of Hereford*, called alſo *prebendarius epiſcopus*, is one of the twenty-eight minor prebendaries, who has, *ex officio*, the firſt canon's place that falls. He was antiently confeſſor of the biſhop and cathedral, and had the offerings at the altar; on which account he was called the golden prebendary.

PRECE PARTIUM, in law, the continuance of a ſuit by conſent of both parties.

PRECEDENCE, or PRECEDENCY, a place of honour to which a perſon is entitled: this is either of courteſy or of right. The former is that which is due to age, eſtate, *&c.* which is regulated by cuſtom and civility: the latter is ſettled by authority, and when broken in upon gives an action at law.

The point of precedency is thus ſettled by the heralds: after the king, the princes of the blood, as ſons, grandſons, brothers, and nephews of the king; then the archbiſhop of Canterbury, the lord chancellor, or lord keeper of the great ſeal, the archbiſhop of York, the lord high treaſurer, the lord preſident of the privy council, the lord privy ſeal; next dukes, marquiſes, dukes eldeſt ſons, earls, marquiſes eldeſt ſons, dukes younger ſons, viſcounts, earls eldeſt ſons, marquiſes younger ſons, biſhops, barons, ſpeaker of the houſe of commons, viſcounts eldeſt ſons, earls younger ſons, barons eldeſt ſons, knights of the garter commoners, privy counſellors commoners, the chancellor of the exchequer, chief juſtice of the king's bench, maſter of the rolls, chief juſtice of the common pleas, chief baron of the exchequer, juſtices and barons of the ſaid courts, viſcounts younger ſons, barons younger ſons, baronets, knights of the bath, field and flag officers, knights bachelors, maſters in chancery, doctors graduate, ſerjeants at law, eſquires, gentlemen, citizens, yeomen, burgeſſes.

The great officers of the court take place above all others of the ſame order of nobility; *viz.* the maſter of the horſe, lord great chamberlain of England, lord marſhal of England, lord ſteward of the houſehold, and lord chamberlain of his majeſty's houſehold: ſo the ſecretaries of ſtate, if peers, take place of all of that degree, except the great officers aforeſaid. Dukes, marquiſes, earls, *&c.* not having any of the ſaid offices, nor deſcended of the blood royal, take place according to the ſeniority of their creation. The ladies take place according to the quality of their huſbands.

PRECEDENT, in law, a caſe which has been determined, and which ſerves as a rule for all of the ſame nature: thus the precedents of a court have the force of laws, and no court will reverſe a judgment contrary to many precedents.

Precedent alſo frequently denotes an original authentic inſtrument or writing, which ſerves as a form to draw others by.

PRECENTOR, a dignitary in cathedrals, popularly called the chantor, or maſter of the choir.

PRECEPT, in law, a command in writing ſent by a chief juſtice, juſtice of the peace, *&c.* for bringing a perſon, record, or other matter, before him.

Precept is alſo uſed for the command or incitement by which one man ſtirs up another

another to commit felony, theft, &c.

PRECESSION, *præceſſio*, in aſtronomy, a term applied to a ſlow motion of the equinoctial points towards the weſt; that is, in the language of aſtronomers, *in antecedentia*, or contrary to the order of the ſigns. See the article SIGN.

This motion of the equinoctial points is occaſioned by the poles of the world revolving round thoſe of the ecliptic: in order to illuſtrate which, let DCH (plate CCVIII. fig. 2.) be a part of the earth's orbit, C its center, EC the axis of the ecliptic, E its pole, CP the axis of the earth, P its pole; through the points E and P draw the great circle EPA, meeting the ecliptic AL in A; the arch PA is equal to the inclination of the axis of the earth to the plane of the ecliptic, *viz.* the angle PCH, which is found by obſervation to be about 66° 30′, and therefore its complemental arch EP, or angle PCE = 23° 30′.

Through the pole P, from the point E, deſcribe a leſſer circle PFG, which will be parallel to the ecliptic; then, if the axis of the earth be directed at any particular time to P, it is found by obſervations of many years, that it will not be conſtantly directed to the point P, but in ſeventy-two years time be directed to ſome other point Q, ſo that the arch PQ = 1 degree; and therefore, in the ſpace of 360 × 72 = 25920 years, the point P, or pole of the world, will deſcribe the circle PFG, about the pole of the ecliptic E, which revolution is called *annus magnus*, the great year; after which, the ſtars being re-inſtated in their proper places, the antients imagined there would be a total renovation of all things.

The cauſe of this conical motion of the earth's axis was unknown to all the aſtronomers before Sir Iſaac Newton's time, none of them being able to gueſs from whence it could proceed; but this ſublime geometer ſoon inveſtigated its cauſe, and demonſtrated that it reſults from the laws of motion and gravity, that is, from the ſpheroidical figure of the earth; for if the earth was a perfect ſphere, its axis would always continue parallel to itſelf, and conſequently have no ſuch motion. Hence the reaſon of the preceſſion of the equinoctial points may be eaſily conceived; for the circle EPA, paſſing through both the pole of the ecliptic and equator, will be the ſolſtitial colure, and A the ſolſtitial point, when the axis of the earth points to P; but after ſeventy-two years, when it points to Q, then the great circle EQB will be the ſolſticial colure, and B the ſolſtice. And becauſe the equinoctial points are always ninety degrees diſtant from the ſolſtices, they muſt conſequently move in the ſame time, through the ſame arch, and the ſame way, *viz.* weſtward, or in antecedentia.

This retrograde motion, by carrying the equinoctial points to meet the ſun in his apparent annual motion, makes him arrive at them ſooner every year than he would do if thoſe points continued immoveable: and this arch of regreſſion being 50″ a year, or one degree in ſeventy-two years, makes the equinoxes happen 20′ in time ſooner each year than they would otherwiſe do. And though this change be not ſenſible in a few years, yet theſe points are found to have a very different ſituation from what they had two thouſand years ago.

By reaſon of this preceſſion of the equinoctial points, the fixed ſtars ſeem to move towards the eaſt, and thereby to have their longitude, which is always reckoned upon the ecliptic, from the vernal equinoctial point, encreaſed: and hence the conſtellations ſeem to have deſerted the places allotted them by the antient aſtronomers; for inſtance, the beginning of the ſign aries, which in Hipparchus's time, was near the vernal equinoctial point, and gave name to that point of the ecliptic, is now removed near a whole ſign, or thirty degrees, eaſtward; ſo that aries is now where taurus uſed to be, taurus where gemini uſed to be, &c. and thus all the conſtellations of the zodiac have changed their antient places; but to avoid confuſion, aſtronomers have thought fit to let the ſeveral portions of the ecliptic, where theſe conſtellations were at firſt obſerved to be, retain their old names; ſo that the vernal equinoctial point is ſtill reckoned the firſt degree of aries. However theſe portions of the ecliptic, where the conſtellations were at firſt, are called *anaſtra*, to diſtinguiſh them from the places where they now are, which are termed *ſtellata*. See the article CONSTELLATION.

PRECIOUS STONES, or GEMS, in natural hiſtory. See the article GEM.

PRECIPE, or PRAECIPE QUOD REDDAT, in law, a writ that extends as well to writs of right as to other writs of entry and poſſeſſion.

It is ſometimes called a writ of right clofe,

BRITISH MUSEUM

facing page 2570

N°. 1.

Fig. 1. PORCELLAIN SHELLS

N°. 2.

N°. 3.

Fig. 2. PRECESSION.

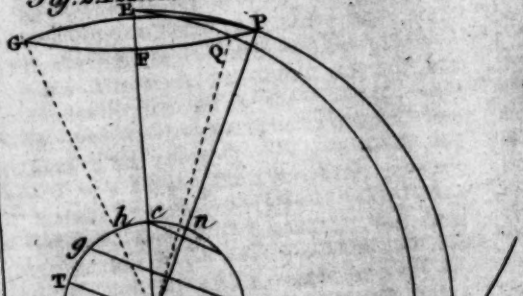


Fig. 3. PRIMULA Veris, the COWSLIP

Fig. 4. PSYLLIUM.

Fig. 5. PTARMICA

Fig. 6. PULMONARIA.

J. Jeffery, sculp.

close, when issued out of the court of chancery close; sometimes a writ of right patent, when it issues out of chancery, patent, or open, to any lords court for any of his tenants deforced, against his deforcer.

PRECIPITANT *præcipitans*, in chemistry, is applied to any liquor, which, when poured on a solution, separates what is dissolved, and makes it precipitate, or fall to the bottom of the vessel.

The term precipitant is also used, in medicine, to denote any remedy that moderates the heat of the blood, by separating, as is supposed, any heterogeneous matter contained therein.

PRECIPITATE, *præcipitatus*, in chemistry, a substance which having been dissolved in a proper menstruum, is again separated from its solvent, and thrown down to the bottom of the vessel, by pouring some other liquor upon it.

White precipitate of mercury is made thus: take of sal armoniac and of corrosive sublimate, each an equal quantity; dissolve them together in common water, and filtrate the solution through paper: then add oil of tartar per deliquium, enough to cause the matter to precipitate: pour off the water, and add more fresh water several times; and when the powder has been thus perfectly freed from its acrimony, let it be dried for use; which is principally in unguents for cutaneous foulnesses, a dram of it to an ounce of pomatum, being the usual proportion; for if used internally, it not only purges and sometimes vomits, but is very apt to bring on a salivation. See the article SALIVATION.

For the other preparations of mercury, improperly called precipitates, see the article MERCURY.

PRECIPITATION, *precipitatio*, a process in chemistry, which is a kind of separation, whereby the particles of a body dissolved and suspended in any menstruous liquor, are detached therefrom, and fall down to the bottom of the vessel. These particles sometimes precipitate of their own accord, but oftener by the assistance of some other liquor added to the menstruum. So that precipitation is the reseparating solid bodies from any fluid menstruum, wherein they are dissolved, by the addition of a third body, which, counteracting the power of the menstruum, causes that which was dissolved to regain its solid form, and subside in the state of a powder.

The great law of precipitation, according to Dr. Shaw, is this; whenever one body has dissolved another, and a third be added to the solution; which third has a greater relation to either of the former, than they have to each other; then the union of the two first will be dissolved, and the third uniting itself either with the first or second, leaves the other at liberty to fall to the bottom, or rise to the top, according to its specific gravity: thus if camphor be dissolved in spirit of wine, and water be added to the solution, it is thereby made to float upon the surface; because there is a greater appetite of union between water and the spirit of wine, than there is between camphor and that spirit.

As precipitation is apparently opposite to solution, its application must be necessarily founded on the same principles. The manner of its performance is a simple commixture of the precipitant with the solution to be precipitated; only with this caution in respect to bodies which produce much ebullition on their mixture, that the precipitant should be added gradually, lest they overflow the vessel.

After the precipitated sediment is perfectly formed, it must be recovered from the fluid by a proper method of exsiccation; to which, in the case of saline bodies, edulcoration is likewise previously necessary. This is best performed by filtring off the fluid and laying out the wet powder, when of a consistence, in drops or pieces, as was before directed in the preparation of powders by levigation.

To account for the process of precipitation. A fluid menstruum may be made to sustain a body specifically heavier than itself, either by making the resistance arising from the cohesion of the parts of the fluid equal to the excess of specific gravity of those bodies above that of the menstruum; or by the heavy bodies being joined to some lighter one; so that the two together only make one whole equal in weight to the fluid. In the first case, we know the resistance is still proportional to the surface of the corpuscles; so that the surface being diminished, the resistance is weakened: the proportion therefore of the tenacity of the menstruum to the gravity of the corpuscles being thus destroyed, a precipitation must ensue.

Boerhaave makes the following observations

tions on the different manner in which precipitation is performed by ſeveral different agents. 1. By water poured on oils diſſolved in alcohol, where the liquor turns milky. 2. By water poured to ſolid reſins diſſolved in alcohol, where alſo the liquor turns milky. 3. By water in the diſtillation of oily ſpirits, if any water run after the ſpirit is drawn off. 4. By acids on acids; thus ſilver and mercury are precipitated out of ſpirit of nitre, in which they have been diſſolved by adding ſpirit of ſalt. 5. By metals with metals, and other bodies. Thus, for example, dilute an ounce of ſilver diſſolved in ſpirit of nitre, with twelve times the quantity of rain water; put poliſhed plates of copper into this liquor, and the ſilver will be precipitated, and the copper diſſolved: then put this ſolution of copper into another glaſs, and add to it poliſhed plates of iron; the copper will be precipitated and caſe over the iron; finally, the copper falls to the bottom, and the iron diſſolves. Pour this ſolution of iron into a freſh glaſs, and drop upon it oil of tartar per deliquium; the diſſolved iron immediately falls to the bottom, and the alkali unites with the acid, and regenerates true nitre, after ſo many changes. Thus does this ſalt travel from one body to another almoſt unaltered, though it is more attracted by one than another, till at length it reſts in that which in this reſpect is the ſtrongeſt, and is from thence expelled, when oil of vitriol is poured upon the nitre thus regenerated. On theſe two principles precipitation depends, and is the true and often abſtruſe cauſe of numberleſs wonderful operations, both in art and nature. Take a grain of white or red precipitate, rub it upon a poliſhed and heated copper-plate, and wherever the matter has paſſed, the copper will immediately look like ſilver; for the copper attracts the acid of the nitre from the calx of the mercury, and thus preſently makes an amalgam upon the ſurface of the copper, and then acquires a ſilver colour. 6. Alkalies often precipitate things diſſolved by acids. This happens frequently, but not always, nor in perfection: alkali precipitates copper diſſolved by an acid, but the copper is afterwards diſſolved by a ſalt made of the two. 7. Acids generally precipitate things diſſolved by alkalies; but in this caſe alſo there are ſome proceſſes which ſhew us exceptions. 8. Sharp ſalts, without being changed, and lying perfectly concealed, have ſtrange and unexpected effects by means of precipitation. If an ounce of luna cornea, which is perfectly ſcentleſs, inſipid, and unactive, and affords no ſign of acrimony in the fire, be ground, and united in a ſtrong heat in a glaſs retort with half an ounce of inodorous and perfectly inſipid regulus of antimony, there inſtantly ariſes an extremely ſtrong poiſon, or an exceedingly corroſive butter of antimony, the exhalation of which proves mortal. We ſee in this one inſtance how dangerous the art of mixing is, and with what care we ought to go about the compounding of bodies.

PRECIPUT, or PRÆCIPUATE, in the french juriſprudence, denotes the right of primogeniture among coparceners, whereby the eldeſt has always the principal fief, or manor.

PRECISION, *præciſio*, among logicians, the ſame with abſtraction. See the article ABSTRACTION.

PRECONISATION, in the conſiſtory of Rome, a declaration made by the cardinal patron, or protector, of a perſon nominated by ſome prince to a prelature, by virtue of letters-patent, whereof he is the bearer; with which the pope complying, gives his collation. See the article COLLATION.

PRECONTRACT, in law, properly ſignifies a contract made before another; but is chiefly applied to marriage-contracts. See CONTRACT and MARRIAGE.

PRECOP, an old decayed city of european Turky, ſituated at the entrance of the Iſthmus which unites Little Tartary to the peninſula of Crim Tartary: eaſt longitude 37° 40′, north latitude 46° 40′.

PRECORDIA, *præcordia*, in anatomy, a general name for the parts ſituated about the heart, in the fore-part of the thorax, as the diaphragm, pericardium, and even the heart itſelf, with the ſpleen, lungs, *&c.* See HEART, DIAPHRAGM, *&c.*

PRECURSOR, *præcurſor*, in theology, denotes a fore-runner, or perſon who goes before any one to notify his coming. The term precurſor, however, is peculiarly applied to St. John the Baptiſt, who is ſtyled the precurſor of Jeſus Chriſt.

PREDECESSOR, properly ſignifies a perſon who has preceded or gone before another in the ſame office or employ-

ment; in which ſenſe, it is diſtinguiſhed from anceſtor. See ANCESTORS.

PREDESTINATION, in general, ſignifies a decree of God, whereby, from all eternity, he ordained ſuch a concatenation of cauſes as muſt produce every event by a kind of fatal neceſſity, and maugre all oppoſition. See the articles FATE, NECESSITY, *&c.*

In this ſenſe, the Turks are great predeſtinarians; and on this account are much more daring in battle, and willingly encounter greater dangers than they would otherwiſe do. See MAHOMETANS.

Predeſtination, among chriſtians, is uſed in a more limited ſenſe, for a judgment or decree of God, whereby he has reſolved, from all eternity, to ſave a certain number of perſons, from thence called elect; ſo that the reſt of mankind being left in a ſtate of impenitence, are ſaid to be reprobated. See REPROBATION.

Nothing has occaſioned more diſputes than this thorny ſubject of predeſtination; the lutherans ſpeak of it with horror, whilſt the calviniſts contend for it with great zeal; the moliniſts and jeſuits preach it down as a moſt dangerous doctrine, whilſt the janſeniſts aſſert it as an article of faith; the arminians, remonſtrants, and pelagians, are all avowed enemies to predeſtination. See LUTHERANS, CALVINISTS, JESUITS, *&c.*

PREDETERMINATION, in philoſophy, that concurrence of God, which determines men in all their actions, both good and evil; and this concurrence, or influence, is called phyſical predetermination, or premotion: for divines maintain, that God has no ſhare in the ſins of mankind, inaſmuch as he only affords his concurrence to the phyſical part of their actions, not to the moral part.

But whether even ſuch a phyſical concurrence be neceſſary, is ſtrongly controverted. The ſcotiſts urge, that all natural cauſes are, of their own natures, determined to certain actions; whence it ſhould ſeem needleſs to call in any farther aſſiſtance: for the nature of fire, for inſtance, being to warm things properly applied to it; when any thing is ſo applied, what occaſion for any foreign influence to cauſe the fire extert its heat upon it? Again, this predetermination ſeems ſtill leſs requiſite to produce human actions; ſince the ſoul muſt be at leaſt allowed the common privilege of a ſecond cauſe, and to produce its own actions as well as other ſtrictly natural agents. See the articles WILL and CAUSE.

The thomiſts, on the other hand, ſtrongly aſſert phyſical predetermination, arguing from the ſubordination of ſecond cauſes to the firſt: for, ſay they, where there are ſeveral ſubordinate cauſes, the lower do not act unleſs moved thereto by the firſt. Another argument they draw from the dominion of God; for according to them, the eſſence of all dominion conſiſts in directing and applying things ſubject thereto, to its own operations; if the dominion be moral, morally; and if it be alſo phyſical, phyſically.

PREDIAL TITHES, are thoſe that are paid of things ariſing and growing from the ground only; as corn, hay, fruit, *&c.* See the article TITHES.

PREDICABLE, among logicians, denotes a general quality which may be predicated, or aſſerted of ſeveral things: thus animal is predicable of mankind, beaſts, birds, fiſhes, *&c.*

Predicables are only general or abſtract ideas, for a farther account of which, ſee the articles ABSTRACT, IDEA, and GENERAL TERMS.

The ſchoolmen reduce predicables to five claſſes, *viz.* genus, ſpecies, proprium, difference, and accidens. See the articles GENUS, SPECIES, *&c.*

PREDICAMENT, among logicians, the ſame with category. See CATEGORY.

PREDICATE, *prædicatum*, in logic, that part of a propoſition which affirms or denies ſomething of the ſubject: thus, in theſe propoſitions, *ſnow is white, ink is not white*, whiteneſs is the predicate which is affirmed of ſnow, and denied of ink. See the article PROPOSITION.

It is a celebrated law in predicates, that nothing is eſteemed to be abſolutely affirmed of another, unleſs it be affirmed in ſuch a manner, as wants nothing either in the ſubject, predicate, or copula to make it true.

This alſo is a noted property of a predicate, that it contains in ſome meaſure its own ſubject; thus metal contains gold, ſilver, copper, *&c.* of which it is predicated.

Every predicate is indeed an attribute; but every attribute is not a predicate; thus ſoul, learning, are attributed to man, but not predicated of him.

PREDICATING, in logic, the act of affirming or denying ſomething of a thing, as a man is not an angel; body is a ſubſtance, *&c.*

Things predicated of others are reduci-

ble, 1. To genera, as animal, of a man, &c. 2. Forms, as whiteneſs, of ſnow, &c. And, 3. Equals, of things of equal extent, as ſpecies, difference, property, &c.

The ſchoolmen diſtinguiſh ſeveral ways of predicating, as, 1. In quod tantum, which is to predicate eſſentially, both as to the thing and manner, as *honour is a virtue*. 2. In quale tantum, which is to predicate accidentally, both as to the thing and manner, as *John is a ſcholar*. And, 3. In quale quid, or in quale poſt quid, which is to predicate both eſſentially and accidentally, as *man is rational*.

PREDICTION, *prædictio*, the foretelling of what is to come, either by divine revelation, art, or conjecture.

PREDOMINANT, *prædominans*, that which prevails, or has ſome ſuperiority, over another thing.

PRE-EMPTION, *præemptio*, a privilege antiently allowed the king's pourveyor, to have the firſt buying of corn, &c. for the king's houſhold, but taken away by ſtat. 19 Car. II.

PREENING, in natural hiſtory, the action of birds dreſſing their feathers, to enable them to glide the more readily through the air, &c.

For this purpoſe they have two peculiar glands on their rump, which ſecrete an unctuous matter into a bag that is perforated, out of which the bird occaſionally draws it with its bill.

PRE-EXISTENCE, *præ exiſtentia*, the ſtate of a thing actually in being before another.

PREFACE, *præfatio*, ſomething introductory to a book, to inform the reader of the deſign, method, &c. obſerved therein; and generally whatever is neceſſary to facilitate the underſtanding of a book.

Prefacing is a peculiar ſpecies of writing, being neither argumentation, diſcourſe, narration, nor apology.

PREFECT, *præfectus*, in antient Rome, one of the chief magiſtrates who governed in the abſence of the kings, conſuls, and emperors.

This power was greateſt under the emperors. His chief care was the government of the city, taking cognizance of all crimes committed therein, and within a hundred miles. He judged capitally and finally, and even preſided in the ſenate. He had the ſuperintendance of the proviſions, building, and navigation.

The preſect of modern Rome differs little from the antient præfectus, his authority only extending to forty miles round the city.

PREFECT *of the prætorium*, *præfectus prætorii*, the leader of the pretorian bands deſtined for the emperor's guards, conſiſting, according to Dion, of 10,000 men. This officer, according to Suetonius, was inſtituted by Auguſtus, and uſually taken from among the knights.

By the favour of the emperors his power grew very conſiderable; to reduce which, Conſtantine divided the prefecture of the prætorium into four prefectures, and each of theſe again he ſubdivided into civil and military departments, though the name was only reſerved to him who was inveſted with the civil authority, and that of comes belli given him who commanded the cohorts.

PREFIX, or AFFIX, in grammar, a particle added at the beginning of a word, either to diverſify its form, or to alter its ſignification.

PREGNANCY, *graviditas*, the ſtate of a woman who has conceived, or is with child. See the articles GENERATION, CONCEPTION, FOETUS, &c.

The ſtopping of the menſtrual diſcharge is the firſt ſign of pregnancy; then the ſwelling of the belly, in a globoſe, not irregular, protuberant figure; and about the twentieth week of pregnancy, the motion of the fœtus: and, indeed, this motion is the only certain ſymptom, by which a living fœtus can be diſtinguiſhed from a mole. See the article MOLE.

The ſeveral diſorders incident to pregnant women, as hæmorrhages, flatulencies, hæmorrhoids, &c. are treated of under their reſpective articles HÆMORRHAGE, FLATULENCY, &c.

But more eſpecially the article ABORTION ought to be conſulted, where the means of preventing this dangerous, and but too often fatal accident, are particularly conſidered.

And as to the methods of delivery, and the treatment both of the mother and child during the time of lying-in, &c. they may be found under the articles DELIVERY, INFANT, LOCHIA, LYING-IN WOMEN, &c.

Negative PREGNANT, in law. See the article NEGATIVE.

PREJUDICE, *præjudicium*, does not mean a judgment merely as prior to another in reſpect of time, but as being paſſed before the things were duly conſidered and fully underſtood. Hence prejudi-

is ſometimes called anticipation, and a preconceived opinion; and makes one of the many cauſes of error. See ERROR.

PRELATE, an eccleſiaſtic raiſed to ſome eminent and ſuperior dignity in the church; as biſhops, archbiſhops, patriarchs, *&c.* See BISHOP, *&c.*

PRELIMINARY, in general, denotes ſomething to be examined and determined, before an affair can be treated of to the purpoſe.

The preliminaries of peace conſiſt chiefly in ſettling the powers of embaſſadors, and certain points in diſpute, which muſt be determined previous to the treaty itſelf. See the articles EMBASSADOR, TREATY, *&c.*

PRELUDE, *præludium*, in muſic, is uſually a flouriſh or irregular air, which a muſician plays off-hand, to try if his inſtrument be in tune, and ſo lead him into the piece to be played. Very often the whole band in the orcheſtra run a few diviſions, to give the tune.

PREMISES, or PREMISSES, *præmiſſæ*, in logic, an appellation given to the two firſt propoſitions of a ſyllogiſm, as going before, or preceding the concluſion. See the article SYLLOGISM.

Premiſes are the foundation or principles of our reaſoning; which being either ſelf-evident or demonſtrative propoſitions, the truth of the concluſion is equally evident.

PREMISES, in law, properly ſignifies the land, *&c.* mentioned in the beginning of a deed. See the article DEED.

PREMISLAW, a city of Poland, in the province of Red Ruſſia, ſituated 110 miles ſouth-eaſt of Cracow: eaſt long. 22°, north lat. 49°.

PREMIUM, or PRÆMIUM, properly ſignifies a reward or recompence; but it is chiefly uſed in a mercantile ſenſe for the ſum of money given to an inſurer whether of ſhips, houſes, lives, *&c.* See the article INSURANCE.

The term premium is alſo applied to what is given for a thing above par, or prime coſt: thus if lottery-tickets ſell for 20s. more than prime coſt, or the price at which the government iſſued them, this 20s. is called a premium.

Some alſo uſe premium in a ſynonymous ſenſe with bounty. See BOUNTY.

A lender of money accepting a voluntary premium from the borrower on payment of principal and intereſt, ſhall not be within the ſtatutes againſt uſury. See the article USURY.

PREMONSTRATENSES, in church-hiſtory, a religious order, inſtituted by St. Norbert, about the year 1119.

PREMOTION, *præmotio*, the ſame with predetermination. See the article PREDETERMINATION.

PREMUNIENTES, in law, writs diſpatched to the biſhops, to call them to parliament; warning them to bring with them the deans and archdeacons, one proctor for each chapter, and two for the clergy of each dioceſe. See the article CONVOCATION.

PREMUNIRE, or PRÆMUNIRE, in law, is taken two ways; either for a writ, or for the offence for which it is granted.

Formerly the church of Rome carried its pretended right of ſupremacy to ſuch a height, that ſeveral ſtatutes were made to check and reſtrain the growing power of the pope; but more eſpecially ſtat. 16 Rich. II. c. 5. commonly known by the name of the ſtatute of premunire, which ordains the puniſhment of offenders on this ſtatute to be this: that they ſhould be out of the king's protection, attached by their bodies, *i. e.* impriſoned at the king's pleaſure, and loſe their lands, goods, and chattels.

Premunire is now chiefly uſed for the above puniſhment, which is incurred not only by thoſe who aſſert the pope's ſupremacy; but alſo by thoſe who refuſe to take the oath of allegiance, or of the king's ſupremacy, *&c.*

It is ſaid no perſon, who has incurred a premunire, can bring any action; and a writ of premunire lies as well for a party grieved, as for the king; but the laws making offences a premunire are ſo very ſevere, that they are ſeldom put in execution.

PRENANTHES, in botany, a genus of the ſyngeneſia-polygamia æqualis claſs of plants, the compound flower of which is not imbricated, but conſiſts of five equal hermaphrodite flowers, which are monopetalous, ligulated, quadridentated, and placed in a ſingle circle: the ſeeds are ſingle, or one after each flower, cordated, and contained in the cup.

PRENDER, in law, ſignifies the power or right a perſon has to take a thing, before it is offered.

And prender de baron, literally ſignifies to take a huſband; but in law it is uſed as an exception, to diſable the widow from purſuing an appeal of murder, againſt one who had killed her former huſband.

ble, 1. To genera, as animal, of a man, &c. 2. Forms, as whiteneſs, of ſnow, &c. And, 3. Equals, of things of equal extent, as ſpecies, difference, property, &c.

The ſchoolmen diſtinguiſh ſeveral ways of predicating, as, 1. In quod tantum, which is to predicate eſſentially, both as to the thing and manner, as *honour is a virtue*. 2. In quale tantum, which is to predicate accidentally, both as to the thing and manner, as *John is a ſcholar*. And, 3. In quale quid, or in quale poſt quid, which is to predicate both eſſentially and accidentally, as *man is rational*.

PREDICTION, *prædictio*, the foretelling of what is to come, either by divine revelation, art, or conjecture.

PREDOMINANT, *prædominans*, that which prevails, or has ſome ſuperiority, over another thing.

PRE-EMPTION, *præemptio*, a privilege antiently allowed the king's pourveyor, to have the firſt buying of corn, &c. for the king's houſhold, but taken away by ſtat. 19 Car. II.

PREENING, in natural hiſtory, the action of birds dreſſing their feathers, to enable them to glide the more readily through the air, &c.

For this purpoſe they have two peculiar glands on their rump, which ſecrete an unctuous matter into a bag that is perforated, out of which the bird occaſionally draws it with its bill.

PRE-EXISTENCE, *præ exiſtentia*, the ſtate of a thing actually in being before another.

PREFACE, *præfatio*, ſomething introductory to a book, to inform the reader of the deſign, method, &c. obſerved therein; and generally whatever is neceſſary to facilitate the underſtanding of a book.

Prefacing is a peculiar ſpecies of writing, being neither argumentation, diſcourſe, narration, nor apology.

PREFECT, *præfectus*, in antient Rome, one of the chief magiſtrates who governed in the abſence of the kings, conſuls, and emperors.

This power was greateſt under the emperors. His chief care was the government of the city, taking cognizance of all crimes committed therein, and within a hundred miles. He judged capitally and finally, and even preſided in the ſenate. He had the ſuperintendance of the proviſions, building, and navigation.

The preſect of modern Rome differs little from the antient præfectus, his authority only extending to forty miles round the city.

PREFECT *of the prætorium*, *præfectus prætorii*, the leader of the pretorian bands deſtined for the emperor's guards, conſiſting, according to Dion, of 10,000 men. This officer, according to Suetonius, was inſtituted by Auguſtus, and uſually taken from among the knights.

By the favour of the emperors his power grew very conſiderable; to reduce which, Conſtantine divided the prefecture of the prætorium into four prefectures, and each of theſe again he ſubdivided into civil and military departments, though the name was only reſerved to him who was inveſted with the civil authority, and that of comes belli given him who commanded the cohorts.

PREFIX, or AFFIX, in grammar, a particle added at the beginning of a word, either to diverſify its form, or to alter its ſignification.

PREGNANCY, *graviditas*, the ſtate of a woman who has conceived, or is with child. See the articles GENERATION, CONCEPTION, FOETUS, &c.

The ſtopping of the menſtrual diſcharge, is the firſt ſign of pregnancy; then a ſwelling of the belly, in a globoſe, not irregular, protuberant figure; and about the twentieth week of pregnancy, the motion of the fœtus: and, indeed, this motion is the only certain ſymptom, by which a living fœtus can be diſtinguiſhed from a mole. See the article MOLE.

The ſeveral diſorders incident to pregnant women, as hæmorrhages, flatulencies, hæmorrhoids, &c. are treated of under their reſpective articles HÆMORRHAGE, FLATULENCY, &c.

But more eſpecially the article ABORTION ought to be conſulted, where the means of preventing this dangerous, and but too often fatal accident, are particularly conſidered.

And as to the methods of delivery, and the treatment both of the mother and child during the time of lying-in, &c. they may be found under the articles DELIVERY, INFANT, LOCHIA, LYING-IN WOMEN, &c.

Negative PREGNANT, in law. See the article NEGATIVE.

PREJUDICE, *præjudicium*, does not mean a judgment merely as prior to another in reſpect of time, but as being paſſed before the things were duly conſidered and fully underſtood. Hence prejudice

is ſometimes called anticipation, and a preconceived opinion; and makes one of the many cauſes of error. See ERROR.

PRELATE, an eccleſiaſtic raiſed to ſome eminent and ſuperior dignity in the church; as biſhops, archbiſhops, patriarchs, *&c.* See BISHOP, *&c.*

PRELIMINARY, in general, denotes ſomething to be examined and determined, before an affair can be treated of to the purpoſe.

The preliminaries of peace conſiſt chiefly in ſettling the powers of embaſſadors, and certain points in diſpute, which muſt be determined previous to the treaty itſelf. See the articles EMBASSADOR, TREATY, *&c.*

PRELUDE, *præludium*, in muſic, is uſually a flouriſh or irregular air, which a muſician plays off-hand, to try if his inſtrument be in tune, and ſo lead him into the piece to be played. Very often the whole band in the orcheſtra run a few diviſions, to give the tune.

PREMISES, or PREMISSES, *præmiſſæ*, in logic, an appellation given to the two firſt propoſitions of a ſyllogiſm, as going before, or preceding the concluſion. See the article SYLLOGISM.

Premiſes are the foundation or principles of our reaſoning; which being either ſelf-evident or demonſtrative propoſitions, the truth of the concluſion is equally evident.

PREMISES, in law, properly ſignifies the land, *&c.* mentioned in the beginning of a deed. See the article DEED.

PREMISLAW, a city of Poland, in the province of Red Ruſſia, ſituated 110 miles ſouth-eaſt of Cracow: eaſt long. 22°, north lat. 49°.

PREMIUM, or PRÆMIUM, properly ſignifies a reward or recompence; but it is chiefly uſed in a mercantile ſenſe for the ſum of money given to an inſurer whether of ſhips, houſes, lives, *&c.* See the article INSURANCE.

The term premium is alſo applied to what is given for a thing above par, or prime coſt: thus if lottery-tickets ſell for 20s. more than prime coſt, or the price at which the government iſſued them, this 20s. is called a premium.

Some alſo uſe premium in a ſynonymous ſenſe with bounty. See BOUNTY.

A lender of money accepting a voluntary premium from the borrower on payment of principal and intereſt, ſhall not be within the ſtatutes againſt uſury. See the article USURY.

PREMONSTRATENSES, in church-hiſtory, a religious order, inſtituted by St. Norbert, about the year 1119.

PREMOTION, *præmotio*, the ſame with predetermination. See the article PREDETERMINATION.

PREMUNIENTES, in law, writs diſpatched to the biſhops, to call them to parliament; warning them to bring with them the deans and archdeacons, one proctor for each chapter, and two for the clergy of each dioceſe. See the article CONVOCATION.

PREMUNIRE, or PRÆMUNIRE, in law, is taken two ways; either for a writ, or for the offence for which it is granted.

Formerly the church of Rome carried its pretended right of ſupremacy to ſuch a height, that ſeveral ſtatutes were made to check and reſtrain the growing power of the pope; but more eſpecially ſtat. 16 Rich. II. c. 5. commonly known by the name of the ſtatute of premunire, which ordains the puniſhment of offenders on this ſtatute to be this: that they ſhould be out of the king's protection, attached by their bodies, *i. e.* impriſoned at the king's pleaſure, and loſe their lands, goods, and chattels.

Premunire is now chiefly uſed for the above puniſhment, which is incurred not only by thoſe who aſſert the pope's ſupremacy; but alſo by thoſe who refuſe to take the oath of allegiance, or of the king's ſupremacy, *&c.*

It is ſaid no perſon, who has incurred a premunire, can bring any action; and a writ of premunire lies as well for a party grieved, as for the king; but the laws making offences a premunire are ſo very ſevere, that they are ſeldom put in execution.

PRENANTHES, in botany, a genus of the ſyngeneſia-polygamia æqualis claſs of plants, the compound flower of which is not imbricated, but conſiſts of five equal hermaphrodite flowers, which are monopetalous, ligulated, quadridentated, and placed in a ſingle circle: the ſeeds are ſingle, or one after each flower, cordated, and contained in the cup.

PRENDER, in law, ſignifies the power or right a perſon has to take a thing, before it is offered.

And prender de baron, literally ſignifies to take a huſband; but in law it is uſed as an exception, to diſable the widow from purſuing an appeal of murder, againſt one who had killed her former huſband.

PRENOMEN, *prænomen*, among the antient Romans, a name prefixed to their family-name, anſwering to our chriſtian name: ſuch are Caius, Lucius, Marcus.

PRENOTION, *prænotio*, a piece of knowledge, naturally preceding ſome other; as the knowledge of the antecedent; which muſt precede that of the conſequent.

PREPARING MEDICINES, *præparantia medicamenta*, ſuch as prepare the morbid humours, and diſpoſe them to ſeparate from the healthy, and paſs off by evacuation.

Some have alſo given the appellation of preparing veſſels, *vaſa præparantia*, to the ſpermatic veſſels. See the articles GENERATION and SPERMATIC.

PREPARATION, *præparatio*, in mathematics, ſomething preparatory to the demonſtration of a propoſition. Thus if a propoſition in geometry is to be demonſtrated, the preparation conſiſts in drawing certain lines; and if a propoſition in arithmetic, in ſome computation to be previouſly made to come at the demonſtration.

PREPARATION, in pharmacy. *&c.* the manner of preparing and managing any medicine, in order to fit it to ſerve the purpoſes for which it is intended.

The operations which go by this name are various, as decoction, infuſion, calcination, ſublimation, *&c.* See the article DECOCTION, *&c.*

PREPARATION, in anatomy, the art of preſerving the parts of animals for anatomical uſes; which is done either by drying them thoroughly, or putting them in a proper liquor.

In drying parts which are thick, when the weather is warm, care muſt be taken to prevent putrefaction, fly-blows, inſects, *&c.* This is eaſily done by the uſe of a ſolution of corroſive ſublimate in ſpirit of wine, in the proportion of two drachms of ſublimate to a pound of ſpirit: the part ſhould be moiſtened with this liquor as it dries, and by this method the body of a child may be kept ſafe even in ſummer. Dried preparations are apt to crack and moulder away in keeping; to prevent this their ſurface ſhould be covered with a thick varniſh, repeated as often as occaſion requires.

Though ſeveral parts prepared dry are uſeful, yet others muſt be ſo managed as to be always flexible, and nearer a natural ſtate; which may be done in a well rectified colourleſs ſpirit of wine, to which is added a ſmall quantity of the ſpirit of vitriol or nitre. When theſe are properly mixed, they neither change their colour nor the conſiſtence of the parts, except where there are ſerous or mucous liquors contained in them. The brain, even of a young child, in this mixture grows ſo firm as to admit of gentle handling, as do alſo the vitreous and chryſtaline humours of the eye. The liquor of the ſebaceous glands and the ſemen, are coagulated by this ſpirituous mixture; and it heightens the red colour of the injection of the blood-veſſels, ſo that after the part has been in it a little time, ſeveral veſſels appear which were before inviſible. If you will compare theſe effects with what Ruyſch has ſaid of his balſam, you will find the liquor above-mentioned to come very near to it. The proportion of the two ſpirits muſt be changed according to the part prepared: for the brain and humours of the eye, you muſt put two drachms of ſpirit of nitre to one pound of ſpirit of wine. In preſerving other parts which are harder, thirty or forty drops of the acid will be ſufficient; a larger quantity will make bones flexible, and even diſſolve them. The part thus preſerved ſhould be always kept covered with the liquor, therefore great care ſhould be taken to ſtop the mouth of the glaſs with a waxed cork and a bladder tied over it, to prevent the evaporation of the ſpirit.

Some prefer malt-ſpirit to ſpirit of wine, becauſe this laſt is apt to change into a brown colour; whereas the malt-ſpirit never loſes its limpid appearance.

PREPENSED, *præpenſus*, in law, denotes fore-thought: thus when a man is ſlain upon a ſudden quarrel, if there was malice prepenſed formerly between them, it makes it murder.

PREPOSITION, *præpoſitio*, in grammar, one of the parts of ſpeech, being an indeclinable particle which yet ſerves to govern the nouns that follow it; ſuch as *per*, *pro*, *propter*; and through, for, with, *&c.*

F. Buffier allows it to be only a modificative of a part of ſpeech, ſerving to circumſtantiate a noun.

PREPOSITUS *villæ*, ſometimes denotes the chief officer of the king in a town, manor, or village. In antient record

he was no more than the lord's bailiff; he is alſo, in later writers, the conſtable or petty conſtable.

PREPUCE, *præputium*, in anatomy, the foreſkin; being a prolongation of the cutis of the penis, covering the glans. See the article PENIS.

PRERGGATIVE, *prærogativa*, a pre-eminence which one perſon has over another.

PREROGATIVE *of the king*, *prærogativa regis*, that power which the king hath, not only over other perſons, but over the ordinary courſe of the common law, in right of his crown.

Such as, that he may pardon a perſon condemned to die, that the king's perſon is ſubject to no man's ſuit, his poſſeſſions cannot he taken from him by any violence, his goods are ſubject to no tribute, nor deſtrainable, *&c.*

PREROGATIVE-COURT, a court belonging to the archbiſhop of Canterbury, wherein wills are proved and adminiſtrations granted that belong to the archbiſhop by his prerogative; that is, where the party, at his death, had five pounds, or upwards, out of the dioceſe where he died, and within the archbiſhop's province. See WILL, PROBATE, *&c.*

All citations and decrees run in the archbiſhop's name.

This court is kept in the common-hall in Doctors-commons, in the afternoon, next day after the Arches. The judge is attended by the regiſter, who ſets down the acts of the court, keeps records, original wills, *&c.* It is called the prerogative-office, now kept in Deans-court, London.

The archbiſhop of York hath alſo the like court, called his exchequer.

PRESA, in the italian muſic, a character or mark ſhewing when and where a performer in a concert is to begin to ſing or play: but in particular, in fugues or canons, it is thus marked ⨦ over the note at which the ſecond part, which is to follow or imitate the firſt, muſt begin. If the mark be repeated a ſecond time, it is to ſhew the place where the third part muſt begin, to imitate the ſecond; and ſo on through all the parts.

PRESAGE, *præſagium*, in antiquity, denotes an augury, or ſign of ſome future event; which was chiefly taken from the flight of birds, the entrails of victims, *&c.* See AUGURY and ARUSPICES.

Among phyſicians, the term preſage is ſometimes uſed for prognoſtic ſign. See the article PROGNOSTIC.

PRESBURG, the capital of Hungary, a large city, on the north ſide of the Danube, fifty miles eaſt of Vienna: eaſt long. 17° 30′, north lat. 48° 20′.

PRESBYS, in ornithology, a name by which ſome have called the regulus criſtatus, or golden crowned wren.

PRESBYTA, πρεσβυτης, in optics, a perſon whoſe eyes being flat, can ſee diſtant objects diſtinctly, but thoſe near confuſedly; which defect of ſight got this appellation, becauſe old people are naturally ſubject to it.

Spectacles, or convex glaſſes, are the only remedy for this defect; for if theſe are well fitted to the degree of flatneſs of the eyes, they cauſe the rays of light to converge in ſuch a manner from near objects, as to make them fall exactly on the retina, and thereby produce diſtinct viſion. See the article VISION.

PRESBYTER, in the primitive chriſtian church, an elder, one of the ſecond order of eccleſiaſtics; the other two being biſhops and deacons. See the articles BISHOP and DEACON.

Preſbyter, or elder, is a word borrowed from the greek tranſlation of the old teſtament, where it commonly ſignifies ruler or governor; it being a note of office and dignity, not of age, and in this ſenſe biſhops are ſometimes called preſbyters in the new teſtament. The preſbyters might baptize, preach, conſecrate and adminiſter the euchariſt in the biſhop's abſence, in his preſence, if he authorized and deputed them; and the biſhops did ſcarce any thing in the government of the church without their advice, conſent and amicable concurrence.

The grand diſpute between the followers of the geneva and roman diſcipline is about the ſameneſs and difference of preſbyters and biſhops at the time of the apoſtles.

PRESBYTERIANS, a ſect of proteſtants, ſo called from their maintaining that the government of the church appointed in the new teſtament was by preſbyteries; that is, by miniſters and ruling elders, aſſociated for its government and diſcipline.

The preſbyterians affirm, that there is no order in the church as eſtabliſhed by Chriſt and his apoſtles, ſuperior to that of preſbyters; that all miniſters being ambaſſadors of Chriſt, are equal by their com-

commiſſion; and that elder or preſbyter, and biſhop are the ſame in name and office: for which they alledge, *Acts* xx. 28, *&c.*

The only difference between them and the church of England, relates to diſcipline and church-government. Their higheſt aſſembly is a ſynod, which may be provincial, national, or œcumenical; and they allow of appeals from inferior to ſuperior aſſemblies; according to *Acts* xv. 2, 6, 22, 23. The next aſſembly is compoſed of a number of miniſters and elders, aſſociated for governing the churches within certain bounds. This authority they found upon *Acts* xi. 30. *Acts* xv. 4, 6, *&c.* The loweſt of their aſſemblies or preſbyteries, conſiſts of the miniſter and elders of a congregation who have power to cite before them any member, and to admoniſh, inſtruct, rebuke and ſuſpend him from the euchariſt. They have alſo a deacon, whoſe office is to take care of the poor.

The ordination of their miniſters is by prayer, faſting, and impoſition of the hands of the preſbytery. This is now the diſcipline of the church of Scotland.

PRESCIENCE, in theology, fore-knowledge, or the knowledge which God has of events before they come to paſs.

PRESCRIPTION, in law, is a right or title acquired by uſe and time, introduced for aſſuring the property of effects, in favour of perſons who have for a certain time had them in their poſſeſſion. Preſcription has been called, a penalty impoſed by the laws upon negligence; but the law of preſcription does not puniſh the indoſence of proprietors, but only interprets their ſilence for their conſent; preſuming that a man who neglects to aſſert his right for a ſeries of years, gives it up. In the common law, preſcription is uſually underſtood of a poſſeſſion from time immemorial, or beyond the memory of man: but in the civil law, and even in our common law, there are preſcriptions of a much ſhorter date. See the article POSSESSION.

The things a perſon may make title to by preſcription are, a fair, market, toll, way, water, rent, common, park, warren, franchiſe, court-leet, waifs, eſtrays, *&c.* There is likewiſe a preſcription againſt actions and ſtatutes: thus by the 31 Eliz. c. 1. it is ordained that all actions, *&c.* that are brought upon ſtatutes, the penalty whereof belongs to the king, ſhall be brought within two years after the offence is committed, or ſhall be void. By our ſtatutes alſo, a judge or clerk convicted of falſe entering of pleas, *&c.* may be ſued within two years; but the crime of maintenance or embracery, whereby perjury is committed by a jury, muſt be proſecuted within ſix days, or otherwiſe the parties preſcribe. See the articles LIMITATION and ACTION.

PRESCRIPTION, in medicine, is the aſſigning a proper and adequate remedy to a diſeaſe, from an examination of its ſymptoms, and an acquaintance with the virtues and effects of the materia medica.

Quincy gives the following directions in relation to preſcriptions. In all chronic caſes, medicines are to be contrived as near to a diet, as poſſible, and therefore the common drinks and foods are to be medicated as far as they will admit, and the caſe requires. But in acute caſes, which are generally dangerous, all aſſiſtance muſt be called in that can be had, according to the exigency of the caſe; and as medicines of efficacy are here made uſe of, they are moſt ſafely diſtributed into boles or draughts, in order that the doſe may be aſcertained to the greateſt exactneſs, eſpecially where opiates are uſed: care is here to be taken to ſet all the helps to co-operate together, ſo that they may not interfere with each other: thus a bole or a powder may be given every three, four, or ſix hours, with a draught, julep, or any other liquid form after it; and herein may be dropt ſpirits, tinctures, *&c.* of the like intention, and alſo into their common drink: and the night-doſes, or others, if neceſſary, may be joined with an opiate: externals, if neceſſary, may alſo be ordered at the ſame time; and if bliſters are applied, as they frequently occaſion ſtranguries and heat of urine, emulſions may come in for common drink. Known medicines ſhould be diſguiſed as much as poſſible, and all extemporaneous medicines be contrived, not only with all the elegance and pleaſantneſs poſſible, but alſo into the ſmalleſt doſes they are capable of: thus draughts to grown perſons ought never to exceed four ounces, and to be ſeldom above three, and boles ought ſeldom to weigh above two drams. But the moſt general and neceſſary rule in all caſes is, to anſwer the end by as few medicines as poſſible, and never to make a cure worſe than the diſeaſe.

PRESENCE, *præſentia*, a term of relation

tion uſed in oppoſition to abſence, and ſignifying the exiſtence of a perſon in a certain place, or the ſtate of a perſon conſidered as co-exiſting with another. In this ſenſe, an obligation is ſaid to be paſſed in preſence of a notary and witneſſes. At the breaking open the ſeal of a minor or abſent perſon, the preſence of a ſubſtitute is neceſſary: where a ſuperior magiſtrate is preſent, it ſometimes takes away the power of an inferior. It has been held, that the preſence of one feoffee may ſerve for all the reſt.

PRESENSANO, a town of Italy, twenty-eight miles north of Naples.

PRESENT, *præſens*, in grammar, the firſt tenſe of a verb, expreſſing the preſent time, or that ſomething is now performing; as *ſcribo*, I write, or am writing. See the article TENSE.

PRESENTATION, in law, the act of a patron offering his clerk to be inſtituted in a benefice of his gift, the ſame being void.

All perſons that have ability to make a purchaſe or grant, may alſo preſent to vacant benefices in their gift; though where a clergyman is patron of a church, he cannot preſent himſelf; but may pray to be admitted by the biſhop, and the admiſſion ſhall be effectual. An infant of any age may alſo preſent in his own name; but a preſentation by a feme covert, muſt be in the name of both huſband and wife. As coparceners make but one patron, they are either to preſent jointly, or the eldeſt may preſent firſt, and the reſt in their turn. Joint-tenants muſt alſo join in a preſentation; and when a corporation preſents, it muſt be under their common ſeal. Aliens born and papiſts cannot preſent to benefices, which are preſented to by the univerſities; but a popiſh recuſant may grant his patronage to another, who may preſent where there is no fraud.

A patron may revoke his preſentation before inſtitution, but not afterwards: and a right of preſenting to the next avoidance of a church, whether granted by will or deed, will paſs; but a preſentation whilſt the church is full, is judged void.

PRESENTE'E, the clerk preſented to a benefice by the patron. See the article PRESENTATION.

PRESENTMENT, in law, a denunciation of jurors, or a juſtice of the peace, or other officers, without any information of an offence inquirable by the court, to which it is preſented; or it may be ſaid to be an information made by the jury in a court before a judge, who has authority to puniſh any offence committed contrary to law; and it is what the grand jury finds and preſents to the court, without any bill of indictment delivered: yet it is afterwards reduced into the form of an indictment. A preſentment is drawn up in a ſhort note by the jurors, as an inſtruction to draw the indictment by it; and preſentments are made by juſtices of the peace, in their ſeſſions of offences againſt ſtatutes, in order to their puniſhment in the ſuperior courts; and alſo in courts-leet and courts-baron, before the ſtewards thereof; as likewiſe by conſtables, church-wardens, ſurveyors of highways, &c. of matters belonging to their reſpective offices.

Aſſize of darrein PRESENTMENT. See the article QUARE.

PRESENTS, in law, the ſame with benevolences, or free gifts; eſpecially thoſe given by the clergy, or the ſtates of the realm, to the king.

PRESEPE, or PRÆSEPE, in aſtronomy, the name given to three nebulous ſtars in the breaſt of cancer. See CANCER.

PRESERVATION, in general, denotes the art of preſerving things in a ſtate of perfection; or, at leaſt, from being ſo far corrupted and ſpoiled, as to be no longer uſeful.

Animal ſubſtances are preſerved by curing, pickling, drying, or chemical preparation. See the articles CURING, PICKLE, PREPARATION, &c.

For the method of preſerving corn in granaries, ſee CORN and GRANARY.

Fruits may be long preſerved in ſpirit of wine, firſt well ſaturated with the ſkins and tinging parts of thoſe fruits; and many may be tolerably preſerved in perfectly fermented liquors, which generate no more air. The more ſolid vegetable ſubſtances may be preſerved by gently drying in the ſun, ſhade, or other ſlack heat. Thus peas or beans may be dried young in a ſlack oven in their proper ſeaſon, and may afterwards be boiled in the winter, and will eat young and tender, as if juſt gathered. The ways of preſerving fruits, both dry and moiſt, with ſugar, are now univerſally known; and there are in the ſeveral ways many ſecrets in the hands of particular artiſts, which it would be well to have generally known. See the article FRUIT.

As for the methods of curing and preſerving

ſerving vegetable juices and liquors by decoction, inſpiſſation, fermentation, clarification, matching, &c. See DECOCTION, INSPISSATING, &c.

PRESERVATIVE, among phyſicians, denotes a medicine taken by way of precaution; or, to ſecure a man from a diſeaſe that threatens him.

The principal preſervatives, according to Boerhaave, are abſtinence, quiet, drinking warm water; and, after this, a gentle and continued motion till the firſt appearance of ſweat; then a profound ſleep, the body being well covered.

In the time of a plague, preſervatives are very neceſſary againſt the contagion of the air.

Generous wines, cardiacs, and ſudorifics, are alſo powerful preſervatives.

PRESIDENT, *præſes*, an officer created or elected to preſide over a company, in contradiſtinction to the other members, who are called reſidents.

The lord preſident of the council is the fourth great officer of the crown, as antient as king John, when he was ſtiled conciliarius capitalis. His office is to attend on the king, propoſe buſineſs at the council table, and report the tranſactions there to the king. See COUNCIL.

The lord preſident of the court of ſeſſion, in Scotland, is the firſt of the fifteen lords, who preſides in that auguſt aſſembly, which is the ſupreme court of juſtice in that kingdom. See SESSION.

PRESIDIAL, a bench of judges eſtabliſhed in the ſeveral cities of France, to judge ultimately of all the cauſes brought before them by way of appeal from the ſubaltern judges.

The edict of 1551 eſtabliſhes preſidials thus: 1. That they may judge definitively to the ſum of two hundred and fifty livres, or ten livres per annum. 2. To the ſum of one thouſand five hundred livres by proviſion.

PRESIDII, a ſmall territory in Italy, on the coaſt of Tuſcany, called *State del preſidii*, or the garriſons; conſiſting of ſeveral towns garriſoned by the king of Spain, of which the chief are Orbitello, Porto Hercole, and Telamon.

PRESS, *prelum*, in the mechanic arts, a machine of wood, or iron, ſerving to ſqueeze any body very cloſe. Thus, let AB plate CCX. fig. 2. be a cheeſe-preſs; where CE, FG, are levers moveable about the points, D, E, F, G, by applying the hand at C; S, the ſtone, or weight; and H, the cheeſe to be preſſed. Now if CD = 5, DE = 2, FG = 6, GH = 2, FR = 1, FH = 4; then in the lever CE, D is the fulcrum. Call the power at C 1; then the force at E or F is $\frac{5}{2}$. And in the lever FG, whoſe fulcrum is G, if the power at F be 1, the force at R is $\frac{6}{5}$; and therefore the power at C is to the weight S, as 1 to $\frac{5}{2} \times \frac{6}{5}$, or 3. Alſo the weight of the ſtone at R is to the preſſure at H, as 2 to 5, or 1 to $\frac{5}{2}$; and the power at C is to the preſſure at H, as 1 to $\frac{3}{1} \times \frac{5}{2}$, or 7 $\frac{1}{2}$.

Preſſes uſually conſiſt of ſix pieces; two flat ſmooth planks, between which the things to be preſſed are laid; two ſcrews or worms faſtened to the lower plank, and paſſing thro' two holes in the upper; and two nuts in form of an S, that ſerve to drive the upper plank, which is moveable, againſt the lower which is fixed.

Preſſes uſed for expreſſing liquors are in moſt reſpects the ſame with the common preſſes, only the under plank is perforated with a great number of holes for the juice to run through. Others have only one ſcrew or arbor, paſſing through the middle of the moveable plank, which deſcends into a kind of ſquare box, full of holes, through which the juices flow, as the arbor is turned.

But that the reader may be enabled to form a more diſtinct idea of theſe preſſes, we ſhall give a draught of the common and great wine preſs uſed for ſqueezing the juice out of grapes.

AB (plate CCIX. fig. 1.) is the baſe or pedeſtal and other ſupporters of the common wine-preſs. C, C, the cheeks, which are upright beams, the lower extremities of which are ſunk in the earth, where they are ſtrongly fixed by croſs-bars and maſonry: they are traverſed at top by two beams, the lowermoſt of which is the nut, or receptacle of the ſcrew. D is the ſcrew with its wheel. E the bearer, or large piece of timber on which the wheels reſt, in order to ſink the beams croſſing the planks that cover the grapes, F. G, G, the maye, or planks on which the grapes are diſpoſed, in order to be ſqueezed: theſe planks are cut in notches, to receive the liquor and convey it to a veſſel appropriated to receive it. The maye is ſupported on a maſſive work of maſonry. H is the wheel that ſerves to force down the ſcrew and bearer upon the grapes, which are laid upon the maye in a ſquare heap; this it does by winding off the cord from the

Fig. 1. The common *WINE-PRESS.*

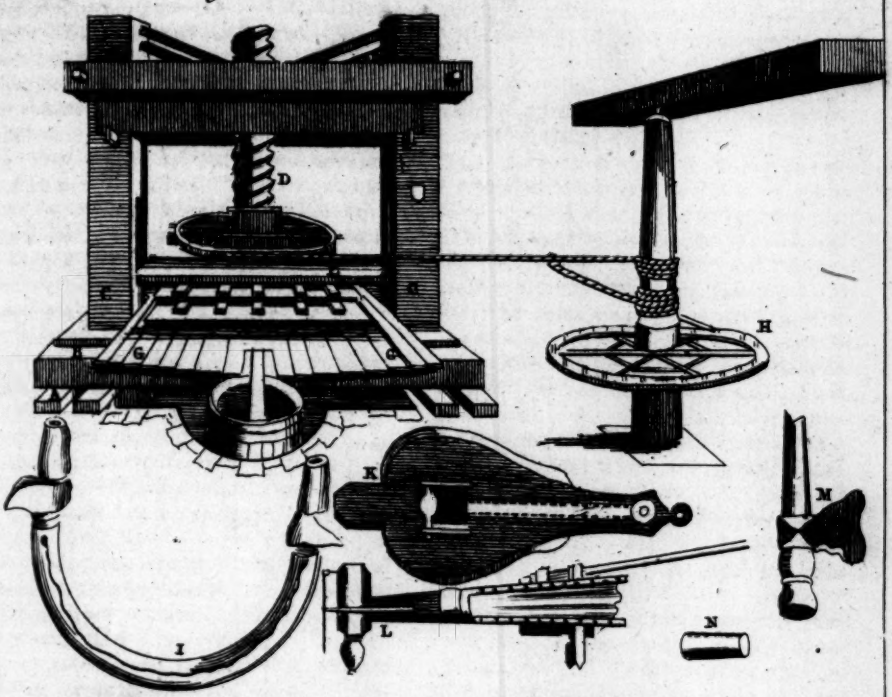


Fig. 2. The great *WINE-PRESS.*

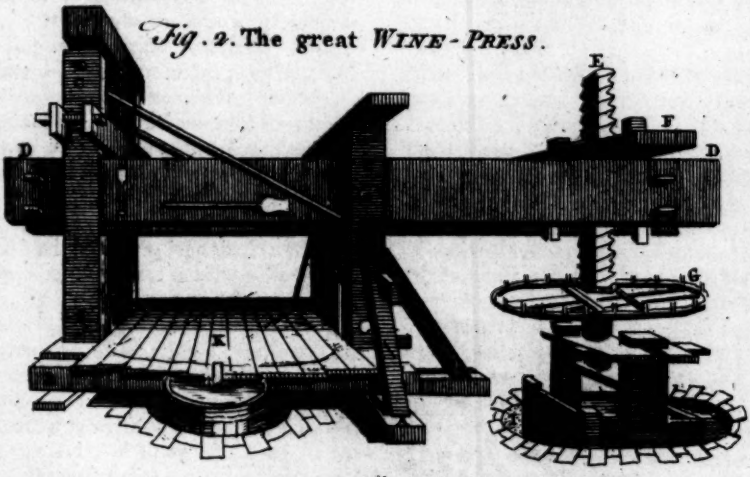


Fig. 3. A *PRESS* to make Verjuice, or to Squeese Apples

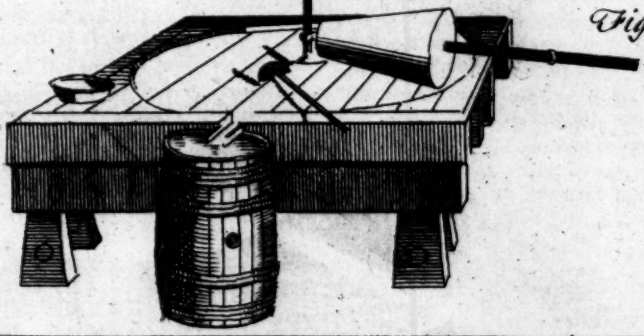


Fig. 4. PRISM

T. Jefferys sculp.

BRITISH MUSEUM

the wheel of the ſcrew D, by which means the ſcrew and the bearer E, are preſſed down upon the grapes, which are uſually covered with croſs-beams reared above each other. I is a leather-pipe, terminating in two wooden tubes, for conveying the wine from one piece to another. K is a large bellows to agitate the wine when it has ſettled into an even ſurface in both veſſels. L the ſame bellows in profile. M is a large fountain, which affords a quick flow. And N is a ſtopple to cloſe the veſſel newly filled, and prevent the wine from running over, upon withdrawing the wooden tube.

A B (*ibid.* fig. 2.) repreſents the baſe and other ſupports of the great wine-preſs; C, C, *&c.* the cheeks, or ſide-beams; D, D, great beams, two in number at leaſt, and frequently four, or even ſix; E, the ſcrew; F, the nut of the preſs; G, the wheel, which, by the help of five or ſix men, turns the ſcrew; and H, the cage, which is an aſſemblage of ſeveral ſtrong pieces of timber formed into a ſquare, and lined with maſonry within. This cage is ten feet long, and four and an half broad on each ſide, and may be either raiſed out of, or ſunk into the pit of maſon-work I; from whence it is exhibited as aſcending in the figure referred. It uſually weighs three thouſand pounds; and being ſuſpended in the manner repreſented, forms, in conjunction with the ſcrew, a lever of an immenſe force for ſqueezing down a bearer upon grapes placed upon the maye K, as in the former figure. See the article WINE.

As to cyder-preſſes, the beſt and leaſt chargeable, is that called the box-preſs (*ibid.* fig. 3.) with which you may ſqueeze apples, pears, grapes, or any other fruit, to make wine, cyder, perry, or verjuice: for as one end of the box terminates in a moveable beam, which is worked by a wheel and a ſcrew in the uſual manner; ſo there are holes in the ſide of the box, through which the juice flows by a ſpout into the veſſel deſigned to receive it. See the article CYDER.

The olive-preſs has been already deſcribed under the article OLIVE.

The preſs uſed by joiners to keep cloſe the pannels, *&c.* of wainſcot, conſiſts of two ſcrews, and two pieces of wood four or five inches ſquare, and two or three feet long, whereof the holes at the two ends ſerve for nuts to the ſcrews.

The preſs uſed by inlayers, reſembles the joiners-preſs, only the pieces of wood are thicker, and only one of them moveable; the other, which is in form of a treſſel, being ſuſtained by two legs joined into it at each end.

This ſerves for ſawing and cleaving of wood required in marquetry. See the article MARQUETRY.

The founders preſs is a ſtrong ſquare frame, conſiſting of four pieces of wood firmly joined together with tenons, *&c.* It is of various ſizes: two of them are required to each mould, at the two extremes whereof they are placed; ſo as that, by driving wooden wedges between the mould and ſides of the preſs, the two parts of the mould for the metal may be preſſed cloſe together. See FOUNDERY.

The book-binders-preſs conſiſts of two large wooden cheeks joined by two ſtrong wooden ſcrews; which, being turned by an iron-bar, draw together or ſet aſunder the cheeks at pleaſure. See BOOK-BINDING.

The cheeks are placed flat on a wooden ſtand, in form of a cheſt, into which the cuttings fall. A-ſide of the cheeks are two pieces of wood of the ſame length with the ſcrews, ſerving to direct the cheeks. Upon the cheeks is the ſhaft or fuſt, to which the cutting-knife is faſtened by a ſcrew which has its key to diſmount it on occaſion.

The ſhaft conſiſts of ſeveral parts; a wooden ſcrew, which, catching within the nut of the two feet that ſuſtain it, brings the knife to the paper, which is faſtened in the preſs. This ſcrew, which is pretty long, has two directories, which reſemble thoſe of the ſcrew of the cheeks. To make the ſhaft ſlide ſquare, that foot of the ſhaft where the knife is not fixed, has a kind of groove directed by a thread faſtened along one of the cheeks. Laſtly, the knife is a piece of ſteel ſix or ſeven inches long, pointed a-top, and ſquare all the reſt.

The preſs uſed in the woollen manufactory is a large wooden machine, ſerving to preſs cloaths, ſerges, *&c.* to render them ſmooth, and give them a gloſs. See plate CCX. fig. 4. where N D is a preſs with an iron-ſcrew, and K E a preſs with a wooden ſcrew.

The principal parts of this machine are the cheeks of the preſs, marked A, A, *&c.* the nut, in which the box is fixed, marked B, B; the windlas, C; an iron-ſcrew, D; a wooden-ſcrew, E; a female-ſcrew, or box, to receive the male one, F; the bed to lay the fold-

ed ſtuff on, K; an iron-lantern, L; and a wooden one, M; and N, the ſtuff in the preſs.

The preſs for linnens, ſilks, &c. is called a calender. See CALENDER.

For the rolling and printing preſs, ſee the article PRINTING.

PRESSING, in the manufactures, is the violently ſqueezing a cloth, ſtuff, &c. to render it ſmooth and gloſſy.

There are two methods of preſſing, *viz.* cold or hot.

As to the former, or cold preſſing, after the ſtuff has been ſcoured, fulled, and ſhorn, it is folded ſquare in equal plaits, and a ſkin of vellum, or paſteboard, put between each plait. Over the whole is laid a ſquare wooden plank, and ſo put into the preſs; which is ſcrewed down tight by means of a lever. After it has lain a ſufficient time in the preſs, they take it out, removing the paſteboards, and lay it up to keep.

Some only lay the ſtuff on a firm table, after plaiting and paſteboarding, cover the whole with a wooden plank, and load it with a proper weight.

The method of preſſing hot is this: When the ſtuff has received the above preparations, it is ſprinkled a little with water, ſometimes gum water, then plaited equally, and between each two plaits are put leaves of paſteboard; and between every ſixth or ſeventh plait, as well as over the whole, an iron or braſs-plate well heated in a kind of furnace. This done, it is laid upon the preſs, and forcibly ſcrewed down.

Under this preſs are laid five, ſix, &c. pieces at the ſame time, all furniſhed with their paſteboards and iron-plates. When the plates are well cold, the ſtuffs are taken out and ſtitched a little together to keep them in the plaits.

This manner of preſſing was only invented to cover the defects of the ſtuffs; and, accordingly, it has been frequently prohibited.

PRESSOVIA, a town of Little Poland, ſituated on the Viſtula, twenty miles eaſt of Cracow.

PRESSURE, or PRESSION, in general, denotes the ſqueezing a thing cloſe together. The preſſure of fluids has been already explained under the articles FLUID, AIR, &c.

The Carteſians ſuppoſe the action of air to conſiſt in a ſort of preſſure. But Sir Iſaac Newton has taught us better; for if light conſiſted only in a preſſion, without actual motion, it could not warm ſuch bodies as reflect and refract it; and if it conſiſted in an inſtantaneous motion, as ſuch preſſion ſuppoſes, there would be required an infinite force to produce that motion every moment in every lucid particle: hence it muſt follow, that light would inflect itſelf ad umbram; for preſſion, in a fluid medium, cannot be propagated in right lines beyond any obſtacle which ſhall hinder any part of the motion; but will inflect and diffuſe itſelf every way into thoſe parts of the quieſcent medium, which lie beyond the ſaid obſtacle. See Newton's *Optics*.

PREST, a duty in money paid by the ſheriff upon his account in the exchequer, for money remaining in his hands.

PREST-MONEY, the money given to new liſted ſoldiers, ſo called becauſe it binds thoſe who receive it, to be ready at all times.

PRESTATION, ſignifies the payment of a certain ſum by arch-deacons, and other clergymen, annually to their biſhop.

PRESTER, in phyſiology, a meteor conſiſting of an exhalation, thrown from the clouds downwards with ſuch violence, as by the colliſion it is ſet on fire. It differs from the thunder-bolt in the manner of its inflammation, and its burning and breaking every thing it touches with greater vehemence.

PRESTER JOHN, or JEAN, an appellation given to the king of Abyſſinia, or Ethiopia. See the article ETHIOPIA.

This name is altogether unknown in Ethiopia, where he is called the grand Negus.

PRESTIMONY, in the cannon-law, denotes a fund or revenue, appropriated by the founder for the maintenance of a prieſt; without being erected into any title of benefice, chapel, priory, &c. and which is not ſubject either to the pope, or to the ordinary; but where the patron, and thoſe who have a right from him, are the collators, and nominate and confer, pleno jure. Though others explain it ſomewhat differently.

PRESTO, in the italian muſic, intimates to perform very quick, as *preſtiſſimo* does extremely ſo.

PRESTON, a borough-town, twenty miles ſouth of Lancaſter, which ſends two members to parliament.

PRESUMPTION, in law, ſignifies an opinion or belief of a thing.

There are three kinds of it. 1. Violent preſumption, which is frequently taken

as a full proof; as if a perſon is found killed in a houſe, and at the ſame time a man is ſeen to come out with a bloody ſword or knife, and no other perſon was then in the houſe; this is a violent preſumption, and amounts to a proof that the ſaid man was the murderer. 2. Probable preſumption may be of ſome though but ſmall weight. 3. Light preſumption which ſignifies nothing at all.

Where all the witneſſes to a feoffment, or other deed, are dead, continual and quiet poſſeſſion is a violent preſumption: alſo if a landlord give a receipt for the laſt year's rent due of a long term, it is preſumed in law that all the reſt are likewiſe paid, though the tenant ſhould not be able to produce receipts.

PRESUMPTIVE HEIR, the ſame with heir at law. See the article HEIR.

PRETENCE, or *eſcutcheon of* PRETENCE, in heraldry. See ESCUTCHEON.

PRETENDER; by ſtatute 1 George I. c. 1. the lord treaſurer, *&c.* is impowered to give 100000 pounds as a reward to any one that ſhall ſeize and ſecure his perſon, whenever he ſhall land, or attempt it in England, *&c.*

PRETENSED RIGHT, in law, is where a perſon is in poſſeſſion of lands, and another that is not in poſſeſſion claims and ſues for them; in which caſe, the pretended right is ſaid to be in him who claims and ſues for the ſame.

PRETERIT, *præteritum*, in grammar, a tenſe which expreſſes the time paſt, or an action completely finiſhed; as *ſcripſi*, I have wrote.

But beſides the præterit perfect, as it is called, already explained, there are other two taken notice of by grammarians, *viz.* the imperfect and pluſquamperfect. See the article IMPERFECT.

The pluſquamperfect, *præteritum pluſquam perfectum*, is a tenſe which reſpects a paſt time, and expreſſes that the action was then completely finiſhed; as *ſcripſeram*, I had written.

The ſeveral circumſtances of the paſt time are diſtinguiſhed in latin, greek, *&c.* by particular terminations of the verb. But the modern languages, particularly the engliſh, *&c.* inſtead of different terminations, have uſually recourſe to thoſe of their auxiliaries and participles.

PRETERITION, in rhetoric, a figure whereby, in pretending to paſs over a thing untouched, we take a ſummary view of it.

PRETEXT, a colour or motive, whether real or feigned, for doing ſomething.

PRETEXTA, or TOGA PRÆTEXTA, among the antient Romans, a long white gown, with a border of purple round the edges, and worn by children of quality till the age of puberty, *viz.* by the boys till ſeventeen, when they changed it for the toga virilis; and by the girls, till marriage.

PRETIOUS, or PRECIOUS. See the article PRECIOUS.

PRETOR, or PRÆTOR, a magiſtrate among the antient Romans, not unlike our lord chief juſtices, or lord chancellor, or both in one; as being veſted with the power of diſtributing juſtice among the citizens. At firſt there was only one pretor; but afterwards another being created, the firſt or chief one had the title of pretor urbanus, or the city-pretor; the other was called peregrinus, as being judge in all matters relating to foreigners. But, beſides theſe, there were afterwards created many provincial pretors; who were not only judges, but alſo aſſiſted the conſuls in the government of the provinces, and even were inveſted with the government of provinces themſelves.

PRETORIAN GUARDS, *prætoriæ cohortæ*, in roman antiquity, were the emperor's guards, who at length were increaſed to ten thouſand; they had this denomination, according to ſome, from their being ſtationed at a place in the palace called prætorium: their commander was ſtiled præfectus prætorii. See the article PREFECT.

PRETORIUM, *prætorium*, among the Romans, denoted the hall or court wherein the pretor lived, and wherein he adminiſtered juſtice.

It likewiſe denoted the tent of the roman general, wherein councils of war, *&c.* were held: alſo a place in Rome, where the pretorian guards were lodged.

PREVARICATION, *prævaricatio*, in the civil-law, is where the informer colludes with the defendants, and ſo makes only a ſham proſecution.

PREVARICATION, in our laws, is when a man falſely ſeems to undertake a thing, with intention that he may deſtroy it; where a lawyer pleads booty, or acts by colluſion, *&c.*

It alſo denotes a ſecret abuſe committed in the exerciſe of a public office, or of a commiſſion given by a private perſon.

PREVARICATOR, *prævaricator*, at Cambridge, is a maſter of arts, choſen

ed ſtuff on, K; an iron-lantern, L; and a wooden one, M; and N, the ſtuff in the preſs.

The preſs for linnens, ſilks, &c. is called a calender. See CALENDER.

For the rolling and printing preſs, ſee the article PRINTING.

PRESSING, in the manufactures, is the violently ſqueezing a cloth, ſtuff, &c. to render it ſmooth and gloſſy.

There are two methods of preſſing, *viz.* cold or hot.

As to the former, or cold preſſing, after the ſtuff has been ſcoured, fulled, and ſhorn, it is folded ſquare in equal plaits, and a ſkin of vellum, or paſteboard, put between each plait. Over the whole is laid a ſquare wooden plank, and ſo put into the preſs; which is ſcrewed down tight by means of a lever. After it has lain a ſufficient time in the preſs, they take it out, removing the paſteboards, and lay it up to keep.

Some only lay the ſtuff on a firm table, after plating and paſteboarding, cover the whole with a wooden plank, and load it with a proper weight.

The method of preſſing hot is this: When the ſtuff has received the above preparations, it is ſprinkled a little with water, ſometimes gum water, then plaited equally, and between each two plaits are put leaves of paſteboard; and between every ſixth or ſeventh plait, as well as over the whole, an iron or braſs-plate well heated in a kind of furnace. This done, it is laid upon the preſs, and forcibly ſcrewed down.

Under this preſs are laid five, ſix, &c. pieces at the ſame time, all furniſhed with their paſteboards and iron-plates. When the plates are well cold, the ſtuffs are taken out and ſtitched a little together to keep them in the plaits.

This manner of preſſing was only invented to cover the defects of the ſtuffs; and, accordingly, it has been frequently prohibited.

PRESSOVIA, a town of Little Poland, ſituated on the Viſtula, twenty miles eaſt of Cracow.

PRESSURE, or PRESSION, in general, denotes the ſqueezing a thing cloſe together. The preſſure of fluids has been already explained under the articles FLUID, AIR, &c.

The Carteſians ſuppoſe the action of air to conſiſt in a ſort of preſſure. But Sir Iſaac Newton has taught us better: for if light conſiſted only in a preſſion, without actual motion, it could not warm ſuch bodies as reflect and refract it; and if it conſiſted in an inſtantaneous motion, as ſuch preſſion ſuppoſes, there would be required an infinite force to produce that motion every moment in every lucid particle: hence it muſt follow, that light would inflect itſelf ad umbram; for preſſion, in a fluid medium, cannot be propagated in right lines beyond any obſtacle which ſhall hinder any part of the motion; but will inflect and diffuſe itſelf every way into thoſe parts of the quieſcent medium, which lie beyond the ſaid obſtacle. See Newton's *Optics*.

PREST, a duty in money paid by the ſheriff upon his account in the exchequer, for money remaining in his hands.

PREST-MONEY, the money given to new liſted ſoldiers, ſo called becauſe it binds thoſe who receive it, to be ready at all times.

PRESTATION, ſignifies the payment of a certain ſum by arch-deacons, and other clergymen, annually to their biſhop.

PRESTER, in phyſiology, a meteor conſiſting of an exhalation, thrown from the clouds downwards with ſuch violence, as by the colliſion it is ſet on fire. It differs from the thunder-bolt in the manner of its inflammation, and its burning and breaking every thing it touches with greater vehemence.

PRESTER JOHN, or JEAN, an appellation given to the king of Abyſſinia, or Ethiopia. See the article ETHIOPIA.

This name is altogether unknown in Ethiopia, where he is called the grand Negus.

PRESTIMONY, in the cannon-law, denotes a fund or revenue, appropriated by the founder for the maintenance of a prieſt; without being erected into any title of benefice, chapel, priory, &c. and which is not ſubject either to the pope, or to the ordinary; but whereof the patron, and thoſe who have a right from him, are the collators, and nominate and confer, pleno jure. Though others explain it ſomewhat differently.

PRESTO, in the italian muſic, intimates to perform very quick, as *preſtiſſimo* does extremely ſo.

PRESTON, a borough-town, twenty miles ſouth of Lancaſter, which ſends two members to parliament.

PRESUMPTION, in law, ſignifies an opinion or belief of a thing.

There are three kinds of it. 1. Violent preſumption, which is frequently take

as a full proof; as if a perſon is found killed in a houſe, and at the ſame time a man is ſeen to come out with a bloody ſword or knife, and no other perſon was then in the houſe; this is a violent preſumption, and amounts to a proof that the ſaid man was the murderer. 2. Probable preſumption may be of ſome though but ſmall weight. 3. Light preſumption which ſignifies nothing at all.

Where all the witneſſes to a feoffment, or other deed, are dead, continual and quiet poſſeſſion is a violent preſumption: alſo if a landlord give a receipt for the laſt year's rent due of a long term, it is preſumed in law that all the reſt are likewiſe paid, though the tenant ſhould not be able to produce receipts.

PRESUMPTIVE HEIR, the ſame with heir at law. See the article HEIR.

PRETENCE, or *eſcutcheon of* PRETENCE, in heraldry. See ESCUTCHEON.

PRETENDER; by ſtatute 1 George I. c. 1. the lord treaſurer, *&c.* is impowered to give 100000 pounds as a reward to any one that ſhall ſeize and ſecure his perſon, whenever he ſhall land, or attempt it in England, *&c.*

PRETENSED RIGHT, in law, is where a perſon is in poſſeſſion of lands, and another that is not in poſſeſſion claims and ſues for them; in which caſe, the pretended right is ſaid to be in him who claims and ſues for the ſame.

PRETERIT, *præteritum*, in grammar, a tenſe which expreſſes the time paſt, or an action completely finiſhed; as *ſcripſi*, I have wrote.

But beſides the præterit perfect, as it is called, already explained, there are other two taken notice of by grammarians, *viz.* the imperfect and pluſquamperfect. See the article IMPERFECT.

The pluſquamperfect, *præteritum pluſquam perfectum*, is a tenſe which reſpects paſt time, and expreſſes that the action was then completely finiſhed; as *ſcripſeram*, I had written.

The ſeveral circumſtances of the paſt time are diſtinguiſhed in latin, greek, *&c.* by particular terminations of the verb. But the modern languages, particularly the engliſh, *&c.* inſtead of different terminations, have uſually recourſe to thoſe of their auxiliaries and participles.

PRETERITION, in rhetoric, a figure whereby, in pretending to paſs over a thing untouched, we take a ſummary view of it.

PRETEXT, a colour or motive, whether real or feigned, for doing ſomething.

PRETEXTA, or TOGA PRÆTEXTA, among the antient Romans, a long white gown, with a border of purple round the edges, and worn by children of quality till the age of puberty, *viz.* by the boys till ſeventeen, when they changed it for the toga virilis; and by the girls, till marriage.

PRETIOUS, or PRECIOUS. See the article PRECIOUS.

PRETOR, or PRÆTOR, a magiſtrate among the antient Romans, not unlike our lord chief juſtices, or lord chancellor, or both in one; as being veſted with the power of diſtributing juſtice among the citizens. At firſt there was only one pretor; but afterwards another being created, the firſt or chief one had the title of pretor urbanus, or the city-pretor; the other was called peregrinus, as being judge in all matters relating to foreigners. But, beſides theſe, there were afterwards created many provincial pretors; who were not only judges, but alſo aſſiſted the conſuls in the government of the provinces, and even were inveſted with the government of provinces themſelves.

PRETORIAN GUARDS, *prætoriæ cohortæ*, in roman antiquity, were the emperor's guards, who at length were increaſed to ten thouſand; they had this denomination, according to ſome, from their being ſtationed at a place in the palace called prætorium: their commander was ſtiled præfectus prætorii. See the article PREFECT.

PRETORIUM, *prætorium*, among the Romans, denoted the hall or court wherein the pretor lived, and wherein he adminiſtered juſtice.

It likewiſe denoted the tent of the roman general, wherein councils of war, *&c.* were held: alſo a place in Rome, where the pretorian guards were lodged.

PREVARICATION, *prævaricatio*, in the civil-law, is where the informer colludes with the defendants, and ſo makes only a ſham proſecution.

PREVARICATION, in our laws, is when a man falſely ſeems to undertake a thing, with intention that he may deſtroy it; where a lawyer pleads booty, or acts by colluſion, *&c.*

It alſo denotes a ſecret abuſe committed in the exerciſe of a public office, or of a commiſſion given by a private perſon.

PREVARICATOR, *prævaricator*, at Cambridge, is a maſter of arts, choſen

at a commencement, to make an ingenious ſatirical ſpeech reflecting on the miſdemeanors of the principal members.

PREVENTION, *prævention*, in the canon law, *&c.* the right which a ſuperior perſon has to claim, or tranſact an affair, prior to an inferior one.

PREVESA, a port-town of Albania, or Epirus, ſituated at the entrance of the gulph of Venice, 25 miles north of the iſland of Cephalonia: eaſt long. 21° 15′, north lat 38° 45′.

PRIAMAN, a port-town of the iſland of Sumatra, and a dutch factory: eaſt long. 98°, ſouth lat. 1°.

PRIAPEIA, in poetry, certain obſcene epigrams, and other pieces, on the god Priapus in the greek catalecta.

PRIAPISM, *πριαπισμός*, in medicine, a continual and painful erection of the penis.

PRIAPUS, in medicine, denotes the genital parts in men.

It alſo denotes, in antiquity, a fabulous deity, particularly adored at Lampſacus, the place of his birth, who was revered very much for the extraordinary ſize of his parts.

PRICKING, in the ſea language, is to make a point on the plat or chart, near about where the ſhip then is, or is to be at ſuch a time, in order to find the courſe they are to ſteer. See NAVIGATION.

PRIEST, *ſacerdos*, a perſon ſet apart for the performing of ſacrifice, and other offices of religion.

PRIEST, *preſbyter*, in the chriſtian church, is a perſon inveſted with holy orders; in virtue whereof he has a power to preach, pray, adminiſter the ſacraments, *&c.* And in the romiſh church alſo to bleſs, abſolve, *&c.* See the article PRESBYTER, ORDINATION, CLERGY, *&c.*

PRIMÆ VIÆ, among phyſicians, denote the whole alimentary duct; including the oeſophagus, ſtomach, and inteſtines, with their appendages. See the articles OESOPHAGUS, STOMACH, and INTESTINES.

PRIMAGE, in commerce, a ſmall duty at the water-ſide, uſually about twelvepence per tun, or ſix pence a bale, due to the maſter and mariners of a ſhip; to the maſter, for the uſe of ropes, *&c.* to diſcharge the goods; and to the mariners, for the loading or unloading of the veſſel. See the article DUTY.

PRIMARY-PLANET, in aſtronomy, one that revolves round the ſun as a center. See the article PLANET.

PRIMATE, *primas*, in church-polity, an archbiſhop, who is inveſted with a juriſdiction over other biſhops. See the articles BISHOP, METROPOLITAN, *&c.* Some make a diſtinction between primate and metropolitan; the former having ſome ſort of preheminence over one or more archbiſhops, and the latter only over ſimple biſhops: thus the archbiſhop of Canterbury is ſtiled primate of all England, relating to adminiſtrations, *&c.* which the archbiſhop of York has only within his own province.

PRIME, *primus*, an appellation given to whatever is firſt in order, degree, or dignity among ſeveral things of the ſame or like kind; thus, we ſay, the prime miniſter, prime coſt, *&c.*

Prime is ſometimes uſed to denote the ſame with decimal, or the tenth part of an unit. See the article DECIMAL.

In weights, it ſtands for the twenty-fourth part of a grain. See the articles, WEIGHT and GRAIN.

Prime figure, in geometry, one which cannot be divided into any other figures more ſimple than itſelf, as a triangle among planes, and the pyramid among ſolids. See the article FIGURE.

For prime numbers, in arithmetic. See the article NUMBER.

Prime of the moon is the new moon, when ſhe firſt appears, which is about three days after the change. See MOON.

Prime vertical is that vertical circle, which paſſes through the poles of the meridian, or the eaſt and weſt points of the horizon; whence dials projected on the plane of this circle, are called prime vertical, or north and ſouth dials. See the articles VERTICAL, DIAL, *&c.*

Prime, in the romiſh church, is the firſt of the canonical hours, ſucceeding to lauds.

Prime, in fencing, is the firſt chief of the guards. See the article GUARD.

PRIMICERIUS, in antiquity, the firſt or chief perſons in any office or dignity.

PRIMIER SEISIN, in law, *prima ſeiſina*, or firſt ſeiſin, a branch of the king's prerogative, whereby he had the firſt poſſeſſion of all lands and tenements held of him in chief, whereof his tenant died ſeized in fee; and conſequently the rents and profits thereof, till the heir, if of age, did homage; and, if under age, till he became of age. But all charges ariſing hereby are annulled by ſtat. 12 Car. II.

PRIMING, or *prime of a gun*, is the gunpowder put into the pan or touch-hole of a piece,

a piece, to give it fire thereby. And this is the laſt thing done in charging.

For pieces of ordnance, they have a pointed iron-rod, to pierce the cartridge through the touch-hole, called primer or priming-iron.

PRIMING, among painters, ſignifies the laying on of the firſt colour.

PRIMIPILUS, PRIMOPILUS, PRIMIPILI *centurio*, in antiquity, the centurion of the firſt cohort of a legion, who had charge of the roman eagle. See the article CENTURION.

Hence thoſe who had formerly borne the office of primipile, or firſt centurion of a legion, were called *primipilarii*, *primopilarii*, or *primipilares*; and among other privileges enjoyed by them, moſt of the ſoldiers who died in the campaign left them their heirs.

PRIMITIÆ, the firſt fruits gathered of the earth, whereof the antients made preſents to the gods.

In our law, the primitiæ are one year's profits, after avoidance of every ſpiritual living, as rated in the king's books. See the article ANNATES.

PRIMITIVE, in grammar, is a root or original word in a language, in contradiſtinction to derivative: thus, *God* is a primitive, *godly* derivative, and *god-like* a compound.

PRIMO *Beneficio eccleſiaſtico habendo*, in law, a writ directed from the king to the lord-chancellor; appointing him to beſtow the benefice that ſhall firſt fall in the king's gift, above or under ſuch a value, upon this or that clerk.

PRIMOGENITURE, *primogenitura*, the right of the firſt born.

This right ſeems to be an unjuſt prerogative, and contrary to the natural right: for, ſince it is birth alone gives children a title to the paternal ſucceſſion, the chance of primogeniture ſhould not throw any inequality among them.

It was not till the race of Hugh Capet, that the prerogative of ſucceſſion to the crown was appropriated to the firſt-born. By the antient cuſtom of gavel kind, ſtill preſerved in ſome parts of our iſland, primogeniture is of no account, the paternal eſtate being equally ſhared among the ſons.

PRIMULA, or PRIMULA VERIS, the COWSLIP, in botany, a genus of the pentandria-monogynia claſs of plants, the flower of which conſiſts of one funnel-like petal, with a wide expanded limb, divided into five cordated ſegments: the fruit is a cylindric capſule, containing numerous roundiſh ſeeds. See plate CCVIII. fig. 3.

PRIMUM MOBILE, in the ptolemaic ſyſ. of aſtronomy. See MOBILE.

PRIMUM ENS. See the article ENS.

PRIMUS, in anatomy, an appellation given to ſeveral muſcles, of which there are more than one: thus primus brachii moventium is the ſame with the pectoralis; the primus oculum movens, with adductor or bibitorius, &c.

PRINCE, *princeps*, in polity, a perſon inveſted with the ſupreme command of a ſtate, independent of any other.

Prince alſo denotes a perſon who is a ſovereign in his own territories, yet holds of ſome other as his ſuperior; ſuch are the princes of Germany, who, though abſolute in their reſpective principalities, are bound to the emperor in certain ſervices.

Prince alſo denotes the iſſue of princes, or thoſe of the royal family. In France, they are called princes of the blood. In England the king's children are called ſons and daughters of England: the eldeſt ſon is created prince of Wales. The cadets are created dukes or earls as the king pleaſes. And the title of all the children is royal highneſs: all ſubjects are to kneel, when admitted to kiſs their hand, and at table, out of the king's preſence they are ſerved on the knee. It is high treaſon to violate the eldeſt daughter unmarried.

The prince of Wales is born duke of Cornwal, and immediately entitled to all the revenues belonging thereto. He is afterwards created prince of Wales by inveſtiture with a cap, coronet, gold-verge, and ring, and he holds it by patent. The title and principality were firſt given by Edw. I. to his eldeſt ſon. While Normandy remained to England, he was ſtiled duke of Normandy; but ſince the union, his title is Magnæ Britanniæ Princeps. He is reputed, in law, the ſame perſon with the king; to imagine his death, or violate his wife, is high treaſon.

PRINCE of the *ſenate* in old Rome, the perſon who was called over firſt in the roll of ſenators, whenever it was renewed by the cenſors: he was always of conſular and cenſorian dignity. See the article SENATE.

PRINCE *of the youth*, *princeps juventutis*, a title given to the ſucceſſor nominated by any of the roman emperors in their lifetime.

PRINCE's

PRINCE'S FEATHER, in botany, the ſame with amaranth. See AMARANTH.

PRINCE'S METAL. See METAL.

PRINCIPAL, *principalis*, the chief and moſt neceſſary part of a thing.

In commerce, principal is the capital of a ſum due or lent, ſo called in oppoſition to intereſt. See the article INTEREST.

It alſo denotes the firſt fund put by partners into a common ſtock, by which it is diſtinguiſhed from the calls or acceſſions afterwards required.

PRINCIPAL *point*, in perſpective, is a point in the perſpective plane, upon which a line drawn from the eye perpendicular to the plane falls. It is in the interſection of the horizontal and vertical plane, and called the point of ſight and point of the eye. See PERSPECTIVE.

PRINCIPAL-RAY, in perſpective, that which paſſes perpendicularly from the ſpectator's eye to the perſpective plane. See the article PERSPECTIVE.

PRINCIPAT, a province of the kingdom of Naples, ſituated on the Mediterranean between the provinces of Lavoro and Calabria, and divided into the hither and further principat, with reſpect to the city of Naples.

PRINCIPLE, *principium*, in general, is uſed for the cauſe, ſource, or origin of any thing.

Principles, in phyſics, are often confounded with elements, or the firſt and ſimpleſt parts whereof natural bodies are compounded, and into which they are again reſolvable by the force of fire. See the article ELEMENT.

It is impoſſible to know the virtues of any body, or how mixed bodies of different kinds ſtand related to the human body, either for the preſervation of its functions entire, the reſtoring them when loſt and impaired, or for the total deſtruction thereof, till we know the principles of which they conſiſt, and likewiſe the mixture and proportion of ſuch principles in bodies, to which their effects are principally owing. Wherefore having diſcovered, by various ways, the parts into which a true chemical analyſis reſolves bodies, we muſt look upon ſuch ſimple parts, into which all mixed bodies are capable of being reſolved, and of which they ſeem to be compounded, as the true and genuine principles. The antients, having obſerved, that, in analyſing all bodies whatever, they obtained a ſpirit, or mercury, ſulphur, ſalt, water, and earth, concluded the number of principles to be five.

If wine, for inſtance, be diſtilled in a a proper alembic, a burning-water, or ſpirit, will firſt ariſe; next, an inſipid water, which they call phlegm, a thick viſcid maſs alone remaining in the ſtill. This they put into another veſſel or retort, which being expoſed to a more intenſe heat, a ſmall portion of phlegm comes over firſt; then an acid water, which, according to them, is ſtill ſpirit or mercury; next, a fat oily ſubſtance called ſulphur. What remains in the retort is burnt to aſhes in an open fire. Theſe aſhes are thrown into an earthen veſſel, with a proper quantity of boiling water, which they impregnate with ſalt. This water being filtred through cap-paper, and afterwards evaporated, leaves the ſalt at the bottom. The other part of the aſhes, which the water does not take up, is termed dead earth, or caput mortuum.

Of theſe five ſubſtances the chemiſts have reckoned two to be paſſive, water and earth; and three active, ſpirit, ſulphur, and ſalt; and on theſe laſt they thought the whole virtue and efficacy of the mixed body depended. In this analyſis we may obſerve, that there is a two-fold ſpirit; one oily and inflammable, which riſes firſt by a gentle heat, and is termed ſpirit of wine; another acid and penetrating, like that of vinegar. Beſides theſe, chemiſts give the name of ſpirit to other penetrating, volatile, or urinous liquors, obtained from the parts of animals, ſuch as the ſpirit of urine, hartſhorn, blood, and ſuch like ſubſtances: but the later chemiſts have baniſhed theſe ſpirits from the number of their principles, as being nothing elſe but ſulphur, or ſalt diſſolved in water. Thus ſpirit of nitre, and others of that kind, are only acid ſalts in water; ſpirit of hartſhorn, or urine, alcaline ſalts; and ſpirit of wine, or of turpentine, an etherial attenuated oil.

Some of the moderns deny, likewiſe, that either ſulphur or ſalt deſerve the name of principles, or elements, as not being the moſt ſimple ſubſtances producible by chemiſtry. For ſulphur when treated with due care, may be reſolved into ſalt, water, and earth, as is evident, by diſtilling fetid diſtilled oils ſeveral times with quick-lime; which, by this treatment yield, in large quantities, a volu-

a volatile ſalt diſſolved in phlegm, together with a caput mortuum, or earth. Likewiſe, etherial oils are only fat thick oils, like that of olives, attenuated by ſalts, and diſſolved in water, as may be proved by the two following experiments: if oil of olives, or any other of that kind, be mixed with a fermenting liquor, ſuch as a ſolution of honey in water, the whole will be converted into an inflammable ſpirit. And if a quart of ſpirit of wine, diluted with ſix quarts of common water, be expoſed in a cold place to the open air, the volatile ſalts will fly off, and leave drops of oil ſwimming on the top, which are, in every reſpect, equal to oil of olives, or almonds.

Salt has no better title to a principle than ſulphur, becauſe it may, by proper management, be at length reduced to earth and water.

Water and earth, in the ſtricteſt ſenſe deſerve the name of principles. However in the formation of mixed bodies, a third principle muſt neceſſarily concur with them; for being unactive, they could never produce any thing, unleſs ſet in motion by an active principle, which, according to ſome, is nothing but fire. We acknowledge therefore, ſays Geoffroy, three ſimple ſubſtances, or principles, in bodies; one active, which may be termed fire; and two paſſive, water and earth. From the moſt ſimple union of theſe three, ſalt ariſes; and the next to that is ſulphur, or oil. See the articles EARTH, WATER, FIRE, SALT, SULPHUR, &c.

PRINCIPLE is alſo ſometimes uſed in a ſynonymous ſenſe with axiom or maxim. See the articles AXIOM and MAXIM.

PRINOS, in botany, a genus of the hexandria-monogynia claſs of plants, with a monopetalous rotated flower, the limb of which is divided into ſix oval ſegments: the fruit is a roundiſh berry, containing ſix cells, with a ſingle, oſſeous, obtuſe ſeed in each.

PRINT, the impreſſion taken from a copper-plate. See the article *Rolling-preſs* PRINTING.

A print may be taken off, ſo as that the out-lines and principal ſtrokes may be exactly copied for graving, in the following manner. If the print be not above a year or two old, the paper need only be well moiſtened with water, as for printing; but if it be more antient, it ſhould be laid to ſoak all night in water, and afterward hung in the air till it becomes dry enough for the preſs. The paper thus prepared is to be laid with his printed ſide next the plate, thinly caſed over with white wax; and is thus to be communicated to the rolling-preſs, whereby an impreſſion of the cut will be gained.

Prints, except of India or China, on their being imported, pay a duty of $1\frac{43\frac{1}{2}}{100}$ d. the piece, drawback $1\frac{29\frac{1}{2}}{100}$ d.

PRINTER, a perſon who compoſes and takes impreſſions from moveable characters ranged in order, or front-plates engraven, by means of ink, and a preſs; or from blocks of wood cut in flowers, &c. and taken off in various colours on calicoes, linens, ſilks, &c.

The moſt curious of theſe arts, and that which deſerves the moſt particular explication is the firſt; for to the printers of books are chiefly owing our deliverance from ignorance and error, the progreſs of learning, the revival of the ſciences, and numberleſs improvements in arts, which without this noble invention would have been either loſt to mankind, or confined to the knowledge of a few. The firſt printers were Guttemberg, Fuſt, Schoeffer, Mentel, and Koſter; and the firſt who practiſed this art in England was Fred. Corſeilles, who brought it over from Harlem, in the reign of king Henry VI. The great printers famous for the correctneſs and elegance of their works, were Aldus, and Paulus Manutius; the two Badii; William and Frederic Morel; Oporin; Frobenius; Robert Henry, and Charles Stephens; Gryphius, Turnebus, Torres, Commelin, Plantin, Raphelengius, Vaſcoſan, Bleau, Criſpin, and the two Elzevirs; and among theſe, the learned printers were the Manutii, the Stephenſes, the Bodii, Turnebus, Morel, &c. Plantin had the title of architypographus, or arch-printer, given him by the king of Spain in conſideration of his printing the polyglot of Antwerp. The printers of Germany, &c. generally caſt their own letter, and ſell their own books: theſe are in many places ranked among the members of univerſities, and entitled to the privilege of ſtudents: in England, they are eſteemed a part of the company of ſtationers and booklellers. See the article BOOKSELLER.

PRINTING, the art of taking impreſſions from characters or figures moveable, or

or immoveable, on paper, linen, ſilk, &c. There are three kinds of printing, the one from moveable letters for books; an other from copper-plates for pictures; and the laſt from blocks, in which the repreſentation of birds, flowers, &c. are cut for printing calicoes, linens, &c. the firſt, called common preſs-printing, the ſecond rolling preſs-printing, and the laſt calicoe, &c. printing. The principal difference between the three conſiſts in this, that the firſt is caſt in relievo in diſtinct pieces, the ſecond engraven in creux, and the third cut in relievo, and generally ſtamped, by placing the block upon the materials to be printed, and ſtriking upon the back of it.

Progreſs of PRINTING. Who the firſt inventors of the european method of printing books were, in what city and what year it was ſet on foot, are queſtions long diſputed among the learned. In effect, as the grecian cities contended for the birth of Homer, ſo do the german cities for that of printing. Mentz, Haerlem, and Straſburg, are the warmeſt on this point of honour, and theſe are left in poſſeſſion of the queſtion, which is not yet decided: though it muſt be owned that Mentz has always had the majority of voices. John Guttemburg, and John Fuſt of Mentz; John Mentel of Straſburg, and L. John Koſter of Haerlem, are the perſons to whom this honour is ſeverally aſcribed, by their reſpective countrymen; and they have all their advocates among the learned. However, their firſt eſſays were made on wooden blocks, after the chineſe manner. The book at Haerlem, the vocabulary called Catholicon, and the pieces in the Bodleian library, and that of Bennet-college, are all performed in this way; and the impreſſion appears to have been only given on one ſide of the leaves; after which the two blank ſides were paſted together. But they ſoon found the inconveniencies of this method, and therefore bethought themſelves of an improvement; which was by making ſingle letters diſtinct from one another, and theſe being firſt done in wood, gave room for a ſecond improvement, which was the making them of metal; and, in order to that, forming moulds, matrices, &c. for caſting them. See LETTER.

From this ingenious contrivance we ought to date the origin of the preſent art of printing, contradiſtinguiſhed from the method practiſed by the Chineſe. And of this Schoeffer, or Scheffer, firſt ſervant, and afterwards partner and ſon-in-law of Fuſt, at Mentz, above-mentioned, is pretty generally allowed to be the inventor: ſo that he may properly be reckoned the firſt printer, and the Bible, which was printed with moveable letters in 1450, the firſt printed book; the next was Auguſtine de civitate dei, then Tully's Offices, printed about the year 1461. In theſe books they left the places of the initial letters blank, and gave them to the illuminers to have them ornamented and painted in gold and azure, in order to render the work more beautiful, and, as ſome think, to make their books paſs for manuſcripts. Thus at preſent, in ſome curious works, the initial letter at the beginning of a book, or chapter, is ſometimes left out, and a ſpace is left for its being afterwards printed with various ornaments from a copper-plate.

Some authors tell us, that Fuſt carrying a parcel of Bibles with him to Paris, and offering them to ſale as manuſcripts, the French, upon conſidering the number of books, and their exact conformity to each other, even to a point, and that it was impoſſible for the beſt book-writers to be ſo exact, concluded there was witchcraft in the caſe, and, by their actually indicting him as a conjurer, or threatening to do ſo, extorted from him the ſecret: and hence the origin of the popular ſtory of Dr. Fauſtus.

From Mentz, the art of printing ſoon ſpread itſelf throughout a good part of Europe; Haerlem and Straſburg had it very early; which as the current of authors repreſent it, occaſioned their pretending to the honour of the invention. From Haerlem it paſſed to Rome in 1467, and into England in 1468, by means of Tho. Bourchier, archbiſhop of Canterbury, who ſent W. Turner, maſter of the robes, and W. Caxton, merchant, to Haerlem to learn the art. Theſe privately prevailing with Corſeilles, an under-workman, to come over, a preſs was ſet up at Oxford, and an edition of Ruffinus on the creed was printed the ſame year in octavo. From Oxford, Caxton brought it to London about the year 1470, and the ſame year it was carried to Paris. Hitherto there had been nothing printed but in latin, and the vulgar tongues; and this firſt in roman characters, then in gothic, and at laſt in italic: but in 1486, the Italians caſt

ſet of greek types, and they have alſo the honour of the firſt Hebrew editions which were printed about the ſame time with the greek. Towards the end of the ſixteenth century there appeared various editions of books in ſyriac, arabic, perſian, armenian, coptic or egyptian characters, ſome to gratify the curioſity of the learned, and others for the uſe of the chriſtians of the Levant. Out of Europe, the art of printing has been carried into the three other parts of the world: for Aſia, we ſee impreſſions of books at Goa, and in the Philippines; at Morocco, for Africa; at Mexico, Lima, Philadelphia, New York, Boſton, *&c.* for America. The Turks, indeed, rigorouſly prohibit printing throughout their empire, as imagining that the too frequent communication with books might occaſion ſome change in their religion and government; yet the Jews have ſeveral editions of their books printed at Theſſalonia, and even at Conſtantinople.

Method of PRINTING. The printing-letters or types, as they are ſometimes called, we have already taken notice of, and have deſcribed the method of forming and caſting them under the articles LETTER and *Letter*-FOUNDERY.

The workmen employed in the art of printing are of two kinds; compoſitors, who range and diſpoſe the letters into words, lines, pages, *&c.* according to the copy delivered them by the author; and preſſmen, who apply ink upon the ſame, and take off the impreſſion. The types being caſt, the compoſitor diſtributes each kind by itſelf among the diviſions of two wooden frames, an upper and an under one, called caſes; each of which is divided into little cells or boxes. Thoſe of the upper caſe are in number ninety-eight; theſe are all of the ſame ſize, and in them are diſpoſed the capitals, ſmall-capitals, accented letters, figures, *&c.* the capitals being placed in alphabetical order. In the cells of the lower caſe, which are fifty-four, are placed the ſmall letters with the points, ſpaces, *&c.* The boxes are here of different ſizes, the largeſt being for the letters moſt uſed; and theſe boxes are not in alphabetical order, but the cells which contain the letter oftener wanted, are neareſt the compoſitor's hand. Each caſe is placed a little aſlope, that the compoſitor may the more eaſily reach the upper boxes. The inſtrument in which the letters are ſet is called a compoſing-ſtick, ſee plate CCX. fig. 3. n° 2. which conſiſts of a long and narrow plate of braſs or iron, *&c. c c*, on the right-ſide of which ariſes a ledge *b b*, which runs the whole length of the plate, and ſerves to ſuſtain the letters, the ſides of which are to reſt againſt it: along this ledge is a row of holes, which ſerve for introducing the ſcrew *f*, in order to lengthen or ſhorten the extent of the line, by moving the ſliders *e*, *d*, farther from, or nearer to the ſhorter ledge at the end *a*. Where marginal notes are required in a work, the two ſliding-pieces, *e*, *d*, are opened to a proper diſtance from each other; in ſuch a manner as that while the diſtance between *d* and *c* forms the length of the line in the text, the diſtance between the two ſliding-pieces forms the length of the lines for the notes on the ſide of the page. Before the compoſitor proceeds to compoſe, he puts a rule, or thin ſlip of braſs-plate, cut to the length of the line, and of the ſame height as the letter, in the compoſing-ſtick, againſt the ledge, for the letter to bear againſt. Things thus prepared, the compoſitor having the copy lying before him, and his ſtick in his left-hand, his thumb being over the ſlider *d*; with the right, he takes up the letters, ſpaces, *&c.* one by one, and places them againſt the rule, while he ſupports them with his left thumb by preſſing them to the end of the ſlider *d*; the other hand being conſtantly employed in ſetting in other letters: the whole being performed with a degree of expedition and addreſs not eaſy to be imagined.

A line being thus compoſed, if it end with a word or ſyllable, and exactly fill the meaſure, there needs no further care; otherwiſe more ſpaces are to be put in, or elſe the diſtances leſſened between the ſeveral words, in order to make the meaſure quite full; ſo that every line may end even. The ſpaces here uſed are pieces of metal exactly ſhaped like the ſhanks of the letters; theſe are of various thickneſſes, and ſerve to ſupport the letters, and to preſerve a proper diſtance between the words; but not reaching ſo high as the letters, they make no impreſſion when the work is printed. The firſt line being thus finiſhed, the compoſitor proceeds to the next; in order to which he moves the braſs-rule from behind the former, and places it before it, and thus compoſes another line againſt it after the ſame manner as before:

going on thus till his ſtick is full, when he empties all the lines contained in it into the gally. See the article GALLY.

The compoſitor then fills and empties his compoſing-ſtick, as before, till a complete page be formed, when he ties it up with a cord or pack-thread, and ſetting it by, proceeds to the next, till the number of pages to be contained in a ſheet is completed: which done, he carries them to the impoſing ſtone, there to be ranged in order, and faſtened together in a frame called a chaſe, and this is termed impoſing. The chaſe is a rectangular iron-frame, of different dimenſions, according to the ſize of the paper to be printed, having two croſs pieces of the ſame metal, called a long and ſhort croſs, mortiſed at each end ſo as to be taken out occaſionally. By the different ſituation of theſe croſſes the chaſe is fitted for different volumes: for quartos and octavos, one traverſes the middle lengthwiſe, the other broadwiſe, ſo as to interſect each other in the center: for twelves and twenty-fours, the ſhort croſs is ſhifted nearer to one end of the chaſe: for folios, the long croſs is left entirely out, and the ſhort one left in the middle; and for broad-ſides, both croſſes are ſet aſide. To dreſs the chaſe, or range and fix the pages therein, the compoſitor makes uſe of a ſet of furniture, conſiſting if ſlips of wood of different dimenſions, and about half an inch high, that they may be lower than the letters: ſome of theſe are placed at the top of the pages, and called head-ſticks; others between them to form the inner margin; others on the ſides of the croſſes to form the outer margin, where the paper is to be doubled; and others in the form of wedges to the ſides and bottom of the pages. Thus all the pages being placed at their proper diſtances, and ſecured from being injured by the chaſe and furniture placed about them, they are all untied, and faſtened together by driving ſmall pieces of wood called quoins, cut in the wedge-form, up between the ſlanting ſide of the foot and ſide-ſticks and the chaſe, by means of a piece of hard wood and a mallet, and all being thus bound faſt together, ſo that none of the letters will fall out, it is ready to be committed to the preſſman. In this condition the work is called a form; and as there are two of theſe forms required for every ſheet, when both ſides are to be printed, it is neceſſary the diſtances between the pages in each form ſhould be placed with ſuch exactneſs, that the impreſſion of the pages in one form ſhall fall exactly on the back of the pages of the other, which is called regiſter.

As it is impoſſible but that there muſt be ſome miſtakes in the work, either through the overſight of the compoſitor, or by the caſual tranſpoſition of letters in the caſes; a ſheet is printed off, which is called a proof, and given to the corrector; who reading it over, and rectifying it by the copy, by making the alterations in the margin, it is delivered back to the compoſitor to be corrected. For the characters uſed in correcting a ſheet for the compoſitor, ſee CORRECTION.

The compoſitor then unlocking the form upon the correcting-ſtone, by looſening the quoins or wedges which bound the letters together, rectifies the miſtakes by picking out the faulty or wrong letters with a ſlender ſharp-pointed ſteel-bodkin, and puts others into their places; but when there are conſiderable alterations, and particularly where inſertions or omiſſions are to be made, he is under a neceſſity of over-running. Thus, if one or more words to be inſerted in a line cannot be got in, by changing the ſpaces of a line for leſſer ones, part of the line muſt be put back into the cloſe of the preceding one, or forward into the beginning of the ſubſequent one, and this continued till the words are got in. After this another proof is made, ſent to the author, and corrected as before; and, laſtly, there is another proof, called a reviſe, which is made in order to ſee whether all the miſtakes marked in the laſt proof are corrected.

The preſſman's buſineſs is to work off the forms thus prepared and corrected by the compoſitor; in doing which there are four things required, paper, ink, balls, and a preſs. To prepare the paper for uſe, it is to be firſt wetted by dipping ſeveral ſheets together in water: they are afterwards laid in a heap over each other; and to make them take the water equally, they are all preſſed cloſe down with a weight at the top. The ink is made of oil and lamp-black, for the manner of preparing which, ſee *Printing Ink*. The balls by which the ink is applied on the forms, are a kind of wooden funnels with handles, the cavities of which are filled with wool or hair, as is alſo a piece of alum-leather or pelt nailed over the cavity, and made extremely ſoft by

ſoak-

BRITISH MUSEUM

Fig. 1. POWER.

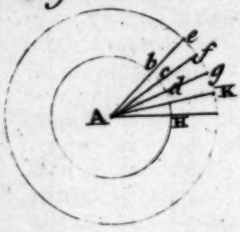


Fig. 2. A Cheese-PRESS.

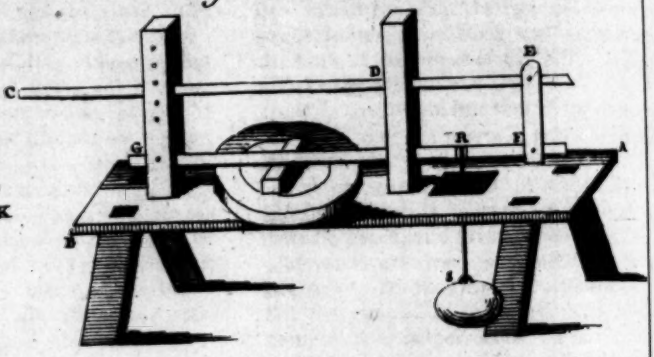


Fig. 3. PRINTING-PRESS.

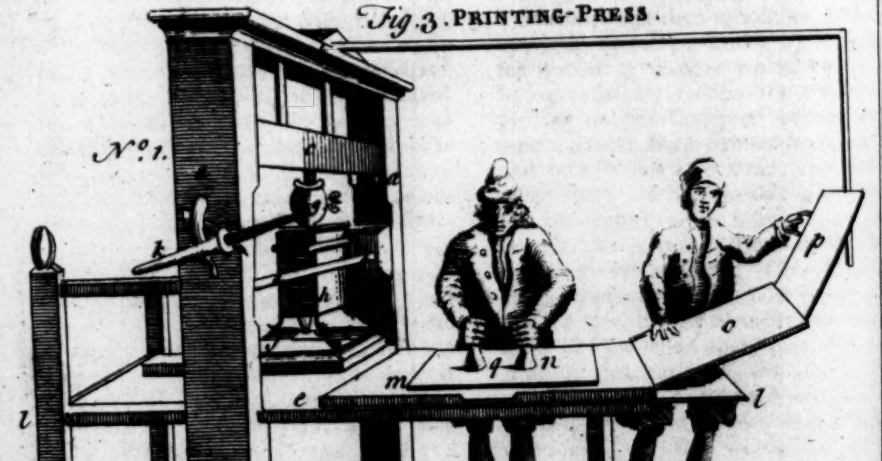
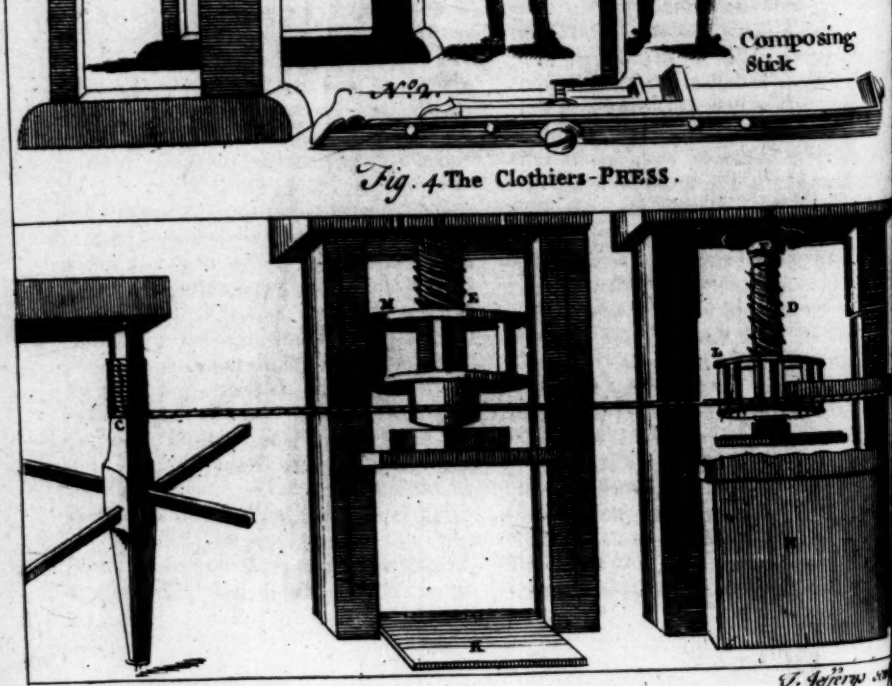


Fig. 4. The Clothiers-PRESS.



T. Jeffrys sc.

ſoaking in urine, and by being well rubbed. One of theſe the preſſman takes in each hand, and applying one of them to the ink-block, dabbs and works them together to diſtribute the ink equally, and then blackens the form which is placed on the preſs, by beating with the balls upon the face of the letter.

The printing-preſs repreſented in plate CCX. fig. 3. n° 1. is a very curious though complex machine; the body conſiſts of two ſtrong cheeks *a a*, placed perpendicularly, and joined together by four croſs-pieces; the cap *b*; the head *c*, which is moveable, being partly ſuſtained by two iron-pins, or long bolts, that paſs the cap; the ſhelves *d d*, which ſerve to keep ſteady a part called the hoſe, and the winter *e*, which bears the carriage, and ſuſtains the effort of the preſs beneath. The ſpindle *f* is an upright piece of iron pointed with ſteel, having a male-ſcrew which goes into the female one in the head about four inches. Through the eye *g* of this ſpindle is faſtened the bar *k*, by which the preſſman makes the impreſſion. Part of the ſpindle is incloſed in a ſquare wooden frame called the hoſe, *h*, and its point works into a braſs-pan ſupplied with oil, which is fixed to an iron-plate let into the top of the platten. At each corner of the hoſe, there is an iron-hook faſtened with pack-thread to thoſe at each end of the platten *i*, in ſuch a manner as to keep it perfectly level. The carriage *l l* is placed a foot below the platten, having its fore-part ſupported by a prop called the fore-ſtay, while the other reſts on the winter. On this carriage, which ſuſtains the plank, are nailed two long iron-bars or ribs, and on the plank are nailed ſhort pieces of iron or ſteel called cramp-irons, equally tempered with the ribs, and which ſlide upon them when the plank is turned in or out. Under the carriage is fixed a long piece of iron called the ſpit, with a double wheel in the middle, round which leather girts are faſtened, nailed to each end of the plank; and to the outſide of the ſpit is fixed a rounce or handle to turn round the wheel. Upon the plank is a ſquare frame or coffin, in which is incloſed a poliſhed ſtone on which the form *n* is laid; at the end of the coffin are three frames, *viz.* the two tympans and friſket: the tympans *o* are ſquare, and made of three ſides of very thin wood, and at the top a piece of iron ſtill thinner; that called the outer tympan faſtened with hinges to the coffin: they are both covered with parchment; and between the two are placed blankets, which are neceſſary to take off the impreſſion of the letters upon the paper. The friſket *p* is a ſquare frame of thin iron, faſtened with hinges to the tympan; it is covered with paper cut in the neceſſary places, that the ſheet, which is put between the friſket and the great or outward tympan, may receive the ink, and that nothing may hurt the margins. To regulate the margins, a ſheet of paper is faſtened upon this tympan, which is called the tympan-ſheet, and on each ſide is fixed an iron-point, which makes two holes in the ſheet, which is to be placed on the ſame points, when the impreſſion is to be made on the other ſide. In preparing the preſs for working, the parchment which covers the outer tympan is wetted till it is very ſoft, in order to render the impreſſion more equable; the blankets are then put in, and ſecured from ſlipping by the inner tympan; then while one preſſman is beating the letter with the balls *q*, covered with ink taken from the ink-block: the other perſon places a ſheet of white paper on the tympan-ſheet, turns down the friſket upon it to keep the paper clean and prevent its ſlipping; then bringing the tympans upon the form, and turning the rounce, he brings the form with the ſtone, *&c.* weighing about 300 pounds weight, under the platten; pulls with the bar, by which means the platten preſſes the blankets and paper cloſe upon the letter, whereby half the form is printed; then eaſing the bar, he draws the form ſtill forward, gives a ſecond pull, and letting go the bar, turns back the form, takes up the tympans and friſket, takes out the printed ſheet and lays on a freſh one; and this is repeated till he has taken off the impreſſion upon the full number of ſheets the edition is to conſiſt of. One ſide of the ſheet being thus printed, the form for the other is laid upon the preſs, and worked off in the ſame manner.

Chineſe PRINTING is performed from wooden planks or blocks, cut like thoſe uſed in printing of callico, paper, cards, *&c.* for the uſe of which, ſee the article LETTER.

This kind of printing is generally allowed to be of very great antiquity. Their blocks are made of ſmooth, cloſe wood, of the ſize of the leaf required, and the copy being fairly wrote on chi-

neſe paper, is ſtruck with the writing downwards on the ſmooth ſide of the wood, and then given to the ſculptor, or cutter in wood; who cuts out all that is to remain white, and leaves only the lines of the writing, which when the work is finiſhed remain in relievo, after which they rub off all remains of the paper. This is ſmeared over with chineſe or indian-ink mixed with water, which is the ſame they uſe in writing, and the paper being laid upon the block is preſſed cloſe to it, and the impreſſion taken off by rolling over it a wooden cylinder with a handle at each end, and is rendered ſoft, and proper to give the impreſſion, by its being covered with a piece of ſoft cotton ſtuff rolled round it.

Rolling-preſs-PRINTING is employed in taking off prints or impreſſions from copper plates engraven, etched, or ſcraped as in mezzotintos. See ENGRAVING *on copper*, ETCHING, and MEZZOTINTO. This art is ſaid to have been as antient as the year 1540, and to owe its origin to Finiguerra, a florentine goldſmith, who pouring ſome melted brimſtone on an engraven plate, found the exact impreſſion of the engraving left in the cold brimſtone, marked with black taken out of the ſtrokes by the liquid ſulphur: upon this he attempted to do the ſame on ſilver-plates with wet paper, by rolling it ſmoothly with a roller; and this ſucceeded: but this art was not uſed in England till the reign of king James I. when it was brought from Antwerp by Speed. The form of the rolling-preſs, the compoſition of the ink uſed therein, and the manner of applying both in taking off prints, are as follow.

The rolling-preſs A L (plate CCXI. fig. 1.) may be divided into two parts, the body and carriage: the body conſiſts of two wooden cheeks, P, P, placed perpendicularly on a ſtand or foot, L M, which ſuſtains the whole preſs. From the foot likewiſe ariſe four other perpendicular pieces *c*, *c*, *c*, *c*, joined by other croſs or horizontal ones, *d*, *d*, *d*, which ſerve to ſuſtain a ſmooth even plank or table H I K, about four feet and a half long, two feet and a half broad, and an inch and a half thick. Into the cheeks go two wooden cylinders or rollers, D E, F G, about ſix inches in diameter, borne up at each end by the cheeks, whoſe ends, which are leſſened to about two inches diameter, and called trunnions, turn in the cheeks about two pieces of wood in form of half-moons, lined with poliſhed iron to facilitate the motion. Laſtly, to one of the trunnions of the upper roller is faſtened a croſs, conſiſting of two levers, A, B, or pieces of wood, traverſing each other, the arms of which croſs ſerve inſtead of the bar or handle of the letter-preſs, by turning the upper roller, and when the plank is between the two rollers, giving the ſame motion to the under one, by drawing the plank forward and backward.

The ink uſed for copper-plates, is a compoſition made of the ſtones of peaches and apricots, the bones of ſheep, and ivory, all well burnt, and called Frankfort black, mixt with nut-oil that has been well boiled, and ground together on a marble, after the ſame manner as painters do their colours.

The method of printing from copper-plates is as follows: they take a ſmall quantity of this ink on a rubber made of linen-rags, ſtrongly bound about each other, and therewith ſmear the whole face of the plate as it lies on a grate over a charcoal-fire. The plate being ſufficiently inked, they firſt wipe it over with a foul rag, then with the palm of the left hand, and then with that of the right; and to dry the hand and forward the wiping, they rub it from time to time on whiting. In wiping the plate perfectly clean, yet without taking the ink out of the engraving, the addreſs of the workman conſiſts. The plate thus prepared is laid on the plank of the preſs; over the plate is laid the paper, firſt well moiſtened, to receive the impreſſion, and over the paper two or three folds of flannel. Things thus diſpoſed, the arms of the croſs are pulled, and by that means, the plate with its furniture, paſſed through between the rollers, which pinching very ſtrongly, yet equally, preſſes the moiſtened paper into the ſtrokes of the engraving, whence it licks out the ink.

PRIOR, in general, ſomething before or nearer the beginning than another, to which it is compared.

PRIOR, more particularly, denotes the ſuperior of a convent of monks, or the next under the abbot. See ABBOT.

Priors are either clauſtral or conventual. Conventual priors are the ſame as abbots. Clauſtral prior is he who governs the religious of an abbey or priory in commendam, having his juriſdiction wholly from the abbot.

Grand PRIOR, is the ſuperior of a large abbey

Fig. 1. ROLLING-PRESS.

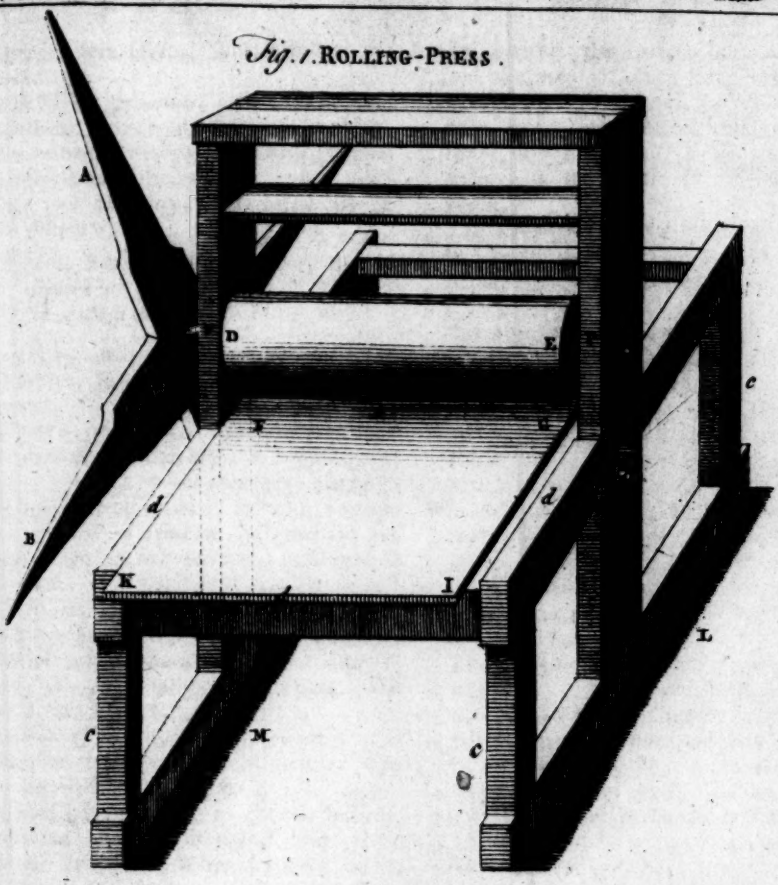
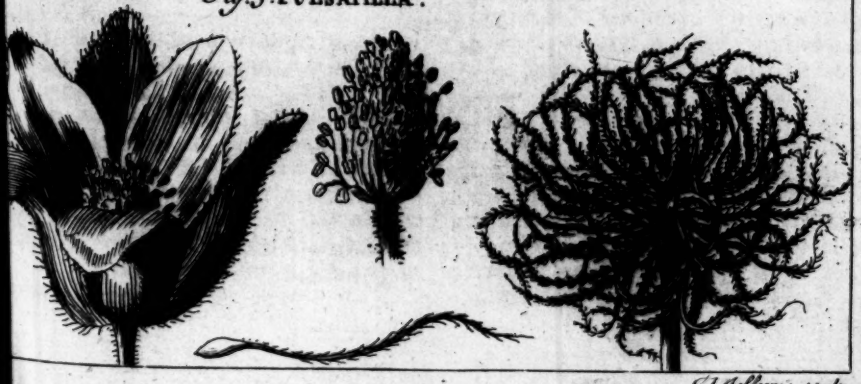


Fig. 2. POINCIANA.

Fig. 3. PULSATILLA.



D. Jefferys sculp.

BRITISH MUSEUM

abbey, where ſeveral ſuperiors are required.

PRIORITY, *prioritas*, the relation of ſomething conſidered as prior to another.

The principal modes of priority are five, in reſpect of time, nature, order, dignity, and cauſality, as ſummed up in this diſtich:

Tempore, natura, prius ordine, dic & honore
Effecto cauſam dicimus eſſe prius.

PRIORITY, in law, denotes an antiquity of tenure, in compariſon of another leſs antient.

Where a prior ſuit is depending, it may be pleaded in abatement of a ſubſequent action; and a prior mortgage ought to be firſt paid off: but it is held, there is no priority of trial in judgments; for that which is firſt executed ſhall be firſt ſatisfied.

PRISAGE, *priſagium*, that part or ſhare which belongs to the king, or admiral, out of prizes taken at ſea from an enemy: this is uſually a tenth part. See the article PRIZE.

PRISAGE *of wines*, a term antiently uſed for what is now called butlerage. See the article BUTLERAGE.

PRISCILLIANISTS, in church hiſtory, chriſtian heretics, ſo called from their leader Priſcillian, a Spaniard by birth, and biſhop of Avila. He is ſaid to have practiſed magic, and to have maintained the principal errors of the manichees; but his peculiar tenet was, that it is lawful to make falſe oaths, in order to ſupport one's cauſe and intereſts.

PRISE, or PRIZE. See PRIZE.

PRISM, in geometry, an oblong ſolid, contained under more than four planes whoſe baſes are equal, parallel, and alike ſituated.

The priſm is generated by the motion of a rectilinear figure, as A B C, (plate CCIX. fig. 4.) deſcending always parallel to itſelf, along the right line A E.

If the deſcribent be a triangle, the body is ſaid to be a triangular priſm; if ſquare, a quadrangular one, *&c.*

From the geneſis of the priſm, it is evident it has two equal and oppoſite baſes A B C and E D F; and it is terminated by as many parallelograms as the baſe conſiſts of ſides; and that all the ſections of a priſm parallel to its baſe are equal. Every triangular priſm may be divided into three equal pyramids.

To meaſure the ſurface of any priſm, find the area of each ſide, whether a triangle, parallelogram, or other rectilinear figure, as directed under theſe articles, and the ſum of all theſe, taken together, is the whole ſuperficies of the priſm.

The ſolid content of a given priſm may be found thus: let the area of the baſe of the priſm be meaſured, as directed under the article TRIANGLE; and let this area be multiplied by the height of the priſm, and the product will give the ſolid content of the priſm.

PRISM, in dioptrics, a triangular glaſs-priſm, much uſed in experiments about the nature of light and colours. See the articles LIGHT and COLOUR.

PRISMOID, *priſmoides*, in geometry, a ſolid figure bounded by ſeveral planes, whoſe baſes are right-angled parallelograms, parallel, and alike ſituated.

PRISON, a gaol, or place of confinement. See the article GAOL.

Lord Coke obſerves, that a priſon is only a place of ſafe-cuſtody, *ſalva cuſtodia*, not a place of puniſhment. Any place where a perſon is confined may be ſaid to be a priſon: and when a proceſs is iſſued againſt one, he muſt, when arreſted thereon, either be committed to priſon, or be bound in a recognizance with ſureties, or elſe give bail, according to the nature of the caſe, to appear at a certain day in court, there to make anſwer to what is alledged againſt him. Where a perſon is taken and ſent to priſon, in a civil caſe, he may be releaſed by the plaintiff in the ſuit; but if it be for treaſon, or felony, he may not regularly be diſcharged until he is indicted of the fact and acquitted. See the article INDICTMENT, and the next article.

PRISONER, a perſon reſtrained or kept in priſon upon an action civil or criminal, or upon commandment: and one may be a priſoner on matter of record or matter of fact. A priſoner upon matter of record, is he who being preſent in court, is by the court committed to priſon; and the other is one carried to priſon upon an arreſt, whether it be by the ſheriff, conſtable, or other officer.

It is held, that the court of king's bench has authority to ſend for a priſoner out of the Marſhalſea priſon by rule of court; but it cannot ſend for a priſoner out of any other priſon without a writ of habeas corpus. Each judge of the king's bench may remit priſoners, together with their

their indictments, to the places where the offences with which they are charged were committed; and likewiſe a priſoner for debt may be removed from the Fleet-priſon to the King's-bench, and thence to the Marſhalſea, on ſomething charged againſt him in the habeas corpus or return, or on bringing the perſon into court.

Priſoners in the king's-bench and Fleet-priſons, on meſne proceſs, *&c.* are actually to be confined within theſe priſons, or the rules of the ſame, till they are diſcharged: and in caſe they are not ſo confined, the profits of the marſhals and wardens will be liable to ſequeſtration for the payment of a debt on judgment upon an eſcape, beſides the common remedy.

For the eaſe of priſoners it is ordered, that thoſe in the King's-bench ſhall not pay above two ſhillings and ſix pence per week chamber-rent: and likewiſe, whilſt any priſoner is kept in cloſe cuſtody, the gaoler, or keeper, is obliged to give him ſuſtenance, and not ſuffer any one to die for want. Alſo, by ſtat. 11 Geo. II. c. 20. it is enacted, that juſtices of peace, in their ſeſſions, may rate every pariſh in their county, not exceeding a ſmall weekly ſum, to be annually paid towards the relief of poor priſoners. There are alſo frequent acts of grace for ſetting at liberty inſolvent debtors.

PRISTINA, a town of european Turky, in the province of Servia, ſeventy miles north-eaſt of Raguſa: eaſt long. 20°, north lat. 43° 15′.

PRISTIS, the SAW-FISH. See the article SAW-FISH.

PRIVATEERS, in maritime affairs, a kind of private ſhips of war, fitted out by private perſons at their own expence; who have leave granted them to keep what they can take from the enemy, allowing the admiral his ſhare. See the article LETTER *of Marque*.

Privateers muſt give bond not to break treaties ſubſiſting with the crown, not to uſe their captives ill, not to commit any ſpoil or depredation on the ſhips of friends or neuters, *&c.* and not to bring away any ſervants, *&c.* from America, without leave.

PRIVATION, in general, denotes the abſence or want of ſomething; in which ſenſe, darkneſs is only a privation of light. See the article LIGHT.

PRIVATION, or rather DEPRIVATION, in the canon-law. See the article DEPRIVATION.

PRIVATIVE, in grammar, a particle which, when prefixed to a word, changes it into a contrary ſenſe.

Among the Greeks the α is uſed as a privative, and among the Latins, *in*. The Engliſh, French, *&c.* borrow both the greek and latin privatives.

PRIVATIVE QUANTITY, or NEGATIVE QUANTITY, in algebra, denotes a quantity leſs than nothing, in oppoſition to affirmative or poſitive; and is expreſſed by the ſign (—) minus, prefixed thereto. See the article QUANTITY.

PRIVET, *liguſtrum*, in botany. See the article LIGUSTRUM.

PRIVILEGE, in law, ſome peculiar benefit granted to certain perſons or places, contrary to the uſual courſe of the law.

Privileges are ſaid to be perſonal or real. Perſonal privileges are ſuch as are extended to peers, embaſſadors, members of parliament and of the convocation, and their menial ſervants, *&c.* See the article PEER, EMBASSADOR, PARLIAMENT, *&c.*

A real privilege is that granted to ſome particular place; as the king's palace, the courts at Weſtminſter, the univerſities, *&c.* See PALACE, COURT, UNIVERSITY, *&c.*

PRIVY, in law, denotes one who is partaker, or has an intereſt in an affair.

Coke mentions four privies; privies in blood, as the heir to his father; privies in repreſentation, as executors and adminiſtrators to the deceaſed; privies in eſtate, as he in reverſion and he in remainder; donor and donee, leſſor and leſſee; laſtly, privy in tenure, as the lord by eſcheat.

PRIVY-COUNCIL. See the article *Privy*-COUNCIL.

PRIVY-SEAL. See the article SEAL.

PRIZE, or PRISE, in maritime affairs, a veſſel taken at ſea from the enemies of a ſtate, or from pirates; and that either by a man of war, a privateer, *&c.* having a commiſſion for that purpoſe.

Veſſels are looked on as prize, if they fight under any other ſtandard than that of the ſtate from which they have their commiſſion; if they have no charter-party, invoice, or bill of lading a-board; if loaded with effects belonging to the king's enemies, or with contraband goods.

Thoſe of the king's ſubjects recovered from

from the enemy, after remaining twenty-four hours in their hands, are deemed lawful prize.

Veſſels that refuſe to ſtrike, may be conſtrained; and if they make reſiſtance and fight, become lawful prize, if taken.

If ſhips of war, the prizes are to be divided among the officers, ſeamen, &c. as his majeſty ſhall appoint by proclamation; but among privateers, the diviſion is according to the agreement between the owners.

By ſtat. 13 Geo. II. c. 4. Judges and officers, failing of their duty, in reſpect to the condemnation of prizes, forfeit five hundred pounds, with full coſts of ſuit; one moiety to the king, and the other to the informer.

PROBABILITY is nothing but the appearance of the agreement or diſagreement of two ideas by the intervention of proofs whoſe connection is not conſtant and immutable, or is not perceived to be ſo; but is, or appears for the moſt part to be ſo; and is enough to induce the mind to judge the propoſition to be true or falſe, rather than the contrary.

Of probability there are degrees from the neighbourhood of certainty and demonſtration, quite down to improbability and unlikeneſs, even to the confines of impoſſibility; and alſo degrees of aſſent, from certain knowledge, and, what is next to it, full aſſurance and confidence, quite down to conjecture, doubt, diſtruſt, and diſbelief.

That propoſition then is probable for which there are arguments or proofs to make it paſs or be received for true. Probability being then to ſupply the defect of our knowledge, is always converſant about a thing whereof we have no certainty, but only ſome inducements to receive it for true. The grounds of it are in ſhort theſe two following:

Firſt, the conformity of any thing with our own knowledge, experience, or obſervation.

Secondly, the teſtimony of others vouching their obſervation and experience. In the teſtimony of others, is to be conſidered, 1. the number; 2. the integrity; 3. the ſkill of the witneſſes; 4. the deſign of the author, if it be a teſtimony cited out of a book; 5. the conſiſtency of the parts and circumſtances of the relation; 6. contrary teſtimonies. The mind, before it rationally aſſents or diſſents to any probable propoſition, ought to examine all the grounds of probability, and ſee how they make more or leſs for or againſt it; and, upon a due balancing the whole, reject or receive it, with a more or leſs firm aſſent, according to the preponderancy of the greater grounds of probability, on one ſide, or the other.

PROBABILITY, in poetry, the appearance of truth in the fable or action of a poem. See the articles DRAMA, FABLE, EPIC, POETRY, &c.

PROBATE of a will or teſtament, in law, is the exhibiting and proving of laſt wills and teſtaments before the eccleſiaſtical judge delegated by the biſhop who is ordinary of the place where the party died.

If all the goods and chattels of the deceaſed, as well as debts owing to him, are in the ſame dioceſe, the biſhop of that dioceſe is intitled to the probate of the will; but if ſuch perſonal eſtate, or effects, are diſperſed in ſeveral dioceſſes, ſo that there be five pounds out of the dioceſe where the party lived, in that caſe the archbiſhop of Canterbury or York becomes ordinary.

A probate may be made two ways, either in common form, or *per teſtes*; the proof in common form is only by the oath of the executor, or party exhibiting the will, who ſwears to his belief, that the will by him exhibited is the laſt will and teſtament of the deceaſed. The proof *per teſtes* is, when beſides his own oath he produces witneſſes, or makes other proof, and that in the preſence of ſuch perſons as may claim any intereſt in the goods of the deceaſed, or at leaſt in their abſence, after they have been duly ſummoned to ſee the will proved, if they think fit; which latter courſe is generally followed where there is fear of contention.

PROBATION, in the univerſities, is the examination and trial of a ſtudent who is about to take his degrees.

PROBATION, in a monaſtic ſenſe, ſignifies the year of novitiate which a religious muſt paſs in a convent, to prove his virtue and vocation, and whether he can bear the ſeverities of the rule.

PROBATIONER, in the church of Scotland, a ſtudent in divinity, who bringing a certificate from a profeſſor in an univerſity of his good morals, and his having performed his exerciſes to approbation, is admitted to undergo ſeveral trials. The trials of probationers are private before

before a preſbytery, and public before a congregation, the preſbytery being preſent. The private trials are an homily or two, and an exegeſis; that is, a theological ſubject is given in to the preſbytery in theſes, and the probationer anſwers any objections which any miniſter in the preſbytery makes againſt thoſe theſes. They alſo examine him on his knowledge of the greek and latin languages, &c. The public trials are a popular ſermon, and an exerciſe and addition; that is, a text is handled half an hour logically and critically, and for half an hour more practically.

If in all theſe he gains the approbation of the preſbytery, he ſigns the confeſſion of faith, and promiſes obedience to the judicatories of the kirk; upon which he receives a licence to preach.

PROBATOR, in law, one who undertakes to prove a crime charged upon another; properly, an accomplice in the crime who impeaches others.

PROBATUM EST, *it is proved*, a term frequently ſubjoined to a receipt for the cure of ſome diſeaſe.

PROBE, a ſurgeon's inſtrument for examining the circumſtances of wounds, ulcers, and other cavities, ſearching for ſtones in the bladder, &c. See the article LITHOTOMY, &c.

PROBLEM, προβλημα, in logic, a propoſition that neither appears abſolutely true or falſe; and, conſequently, may be aſſerted either in the affirmative or negative.

A logical or dialectical problem, according to the ſchoolmen, conſiſts of two parts; a ſubject, about which the doubt is raiſed; and a prædicate, or attribute, which is the thing doubted whether it be true of the ſubject or not.

Problems may be divided into phyſical, ethical, and metaphyſical; phyſical, when it is doubted whether ſuch and ſuch properties belong to certain natural bodies; ethical, when the doubt is, whether or not it be proper to do or omit certain actions; and metaphyſical, when the doubt relates to ſpirits, &c.

PROBLEM, in geometry, is a propoſition, wherein ſome operation or conſtruction is required; as to divide a line or angle, erect or let fall perpendiculars, &c.

According to Wolfius, a problem conſiſts of three parts; the propoſition, which expreſſes what is to be done; the ſolution, wherein the ſeveral ſteps whereby the thing required is to be effected, are rehearſed in order; and, laſtly, the demonſtration, wherein is ſhewn, that by doing the ſeveral things preſcribed in the ſolution, the thing required is obtained.

PROBLEM, in algebra, is a queſtion or propoſition which requires ſome unknown truth to be inveſtigated, and the truth of the diſcovery demonſtrated. So that a problem is to find a theorem. See the article THEOREM.

Kepler's PROBLEM, in aſtronomy, is the determining a planet's place from the time; ſo called from Kepler, who firſt propoſed it. It was this, to find the poſition of a right line, which, paſſing through one of the foci of an ellipſis, ſhall cut off an area deſcribed by its motion, which ſhall be in any given proportion to the whole area of the ellipſis. See the article ANOMALY.

The propoſer knew no way of ſolving the problem but by an indirect method; but Sir Iſaac Newton, Dr. Keill, &c. have ſince ſolved it directly and geometrically ſeveral ways.

Deliacal PROBLEM, or a problem for finding two mean proportionals between two given lines, in geometry, is the doubling of the cube; it was ſo called from the people of Delos, who, upon conſulting the oracle for a remedy againſt a plague, were anſwered, that the plague ſhould ceaſe when Apollo's altar, which was of form of a cube, ſhould be doubled. See the article DUPLICATION.

Local PROBLEM. See the article LOCAL.

PROBLEMATICAL RESOLUTION, in algebra, a method of ſolving difficult queſtions by certain rules, called canons.

PROBOSCIS, in natural hiſtory, is the trunk or ſnout of an elephant, and ſome other animals and inſects. See the article ELEPHANT.

Flies, gnats, &c. are furniſhed with a probоſcis, or trunk; by means of which they ſuck the blood of animals, the juice of vegetables, &c. for their food. See the articles FLY, GNAT, BEE, &c.

PROCATARCTIC CAUSE, in medicine, the pre-exiſting, or pre-diſpoſing cauſe or occaſion of a diſeaſe. See the article DISEASE.

PROCEDENDO, in law, a writ when a plea or cauſe, formerly called from an inferior court to the court of Chancery, King's bench, or court of Common pleas, by writ of privilege, habeas corpus, or certiorari, is releaſed, and returned to the other court to be proceeded

in, upon its appearing that the defendant has no cauſe of privilege, or that the matter in the party's allegation is not well proved.

PROCEDURE, or PROCEEDINGS, in law, the courſe of the ſeveral acts, inſtructions, *&c.* of a proceſs or law-ſuit.

It is either civil or criminal: civil procedure relates to the eſtate alone; criminal or extraordinary procedure, where the perſon is proſecuted.

PROCEED, among merchants, whatever ariſes from any thing.

PROCELEUSMATICUS, in the antient poetry, a foot conſiſting of four ſhort ſyllable, or two pyrrhichiuſes, as *hominibus*. See FOOT and PYRRHICHIUS.

PROCELLARIA, the STORM-BIRD, in ornithology, a genus of birds, belonging to the order of the paſſeres, the characters of which are theſe: the beak is of a compreſſed figure, the upper and under chops are of an equal length, and the upper one is hooked at the point; the noſtrils are of a cylindric form, run parallel, and grow to the beak; and the feet are palmated.

It is about the ſize of the common water-wagtail, and its general colour is black, very gloſſy on the head and back, only the covering feathers of the wings have ſome white toward their tips. Before a ſtorm it always gets under the covert of ſhips ſailing in the northern ſeas, which is a ſure token of an approaching ſtorm; whence the name.

PROCESS, in law, denotes the proceedings in any cauſe, real or perſonal, civil or criminal, from the original writ to the end thereof.

In a more limited ſenſe, proceſs denotes that by which a man is firſt called into any temporal court.

The difference between proceſs and precept, or warrant, is, that the latter is only to attach or convene the party, before any indictment or conviction, and may be either in the king's or juſtice's name: but proceſs is always in the king's name, and commonly after an indictment.

PROCESS, in chemiſtry, the whole courſe of an experiment or ſeries of operations, tending to produce ſomething new.

PROCESS, *proceſſus*, in anatomy, denotes any protuberance or eminence in a bone.

PROCESSION, *proceſſio*, in theology, denotes the manner in which the Holy Ghoſt is conceived to iſſue from the Father and Son, in the myſtery of the Trinity. See the article TRINITY.

PROCESSION alſo denotes a ceremony in the romiſh church, conſiſting of a formal march of the clergy and people, putting up prayers, *&c.* and in this manner viſiting ſome church, *&c.* They have alſo proceſſions of the hoſt or ſacrament, *&c.* See the article HOST, *&c.*

PROCESSUM CONTINUANDO, a writ for continuing a proceſs after the death of the chief juſtice, or other juſtices of oyer and terminer.

PROCHEIN AMY, *proximus amicus*, in law, the perſon next a kin to a child in non-age, and who, in that reſpect, is allowed to act for him, and be his guardian, *&c.* if he hold land in ſoccage.

To ſue, an infant is not allowed to make an attorney; but the court will admit his next friend as plaintiff; or his guardian as defendant.

PROCIDENTIA ANI, UTERI, *&c.* the ſame with prolapſus. See the article PROLAPSUS.

PROCLAMATION, a public notice given of any thing of which the king thinks proper to adverti ſe his ſubjects.

Proclamations are a branch of the king's prerogative, and no perſon can make them without the king's authority, except mayors of towns, *&c.* by cuſtom of privilege. Proclamations which require the people to do, or not to do, certain things, have the force of laws; but then they are ſuppoſed to be conſiſtent with the laws already in being, otherwiſe they are ſuperſeded.

Proclamation is uſed for a ſolemn declaration of war and peace, and for the act of notifying the acceſſion of a prince to the throne; and alſo for the public declaration uſed at the calling of a court, and likewiſe on the diſcharge or adjourning; both for the attendance of perſons, and diſpatch of buſineſs there.

In courts baron, proclamation is made for any perſon to come in and claim copyholds that are vacant, and of which any tenant died ſeiſed ſince the laſt court; after which the lord may ſieze the copyhold, if the heir does not come in to be admitted: and before a parliament is diſſolved, proclamation is made, that if any perſon has any petition he may come in and be heard.

Proclamation of rebellion, is a writ by which a perſon who does not appear upon a ſubpœna, or an attachment of contempt in the court of Chancery, is reputed and declared a rebel, if he does not ſurrender

ſurrender himſelf by a day aſſigned. For proclamation of a fine, and proclamation of exigents, ſee the articles FINE and EXIGENTS.

PROCONDYLUS, a name given to the firſt joint of each finger. See the article CONDYLUS.

PRO-CONFESSO, in law, is where a bill is exhibited in chancery, and the defendant appears, and is in contempt for not anſwering: in this caſe the whole matter contained in the bill ſhall be taken as if it were confeſſed by the defendant.

PROCONSUL, a roman magiſtrate, ſent to govern a province with conſular authority.

The proconſuls were appointed out of the body of the ſenate, and uſually as the year of any one's conſulate expired, he was ſent proconſul into ſome province. The proconſuls decided caſes of equity and juſtice, either privately in their prætorium or palace, where they received petitioners, heard complaints, granted writs under their ſeal, and the like; or elſe publicly, in the common hall, with the uſual formalities obſerved in the court of judicature at Rome. They had beſides, by virtue of their edicts, the power of ordering all things relating to the tribunes, taxes, contributions, and proviſions of corn and money, &c. Their office laſted only a year. See CONSUL.

PROCONSUL, in our antient law books, is the ſame with juſtice in eyre. See the article JUSTICE.

PROCREATION, the begetting and bringing forth children. See the article GENERATION.

PROCTOR, a perſon commiſſioned to manage another perſon's cauſe in any court of the civil or eccleſiaſtical law.

The proctors of the clergy, are the repreſentatives choſen by the clergy to ſit in the lower houſe of convocation: of theſe there are two for each dioceſe, and one for each collegiate church.

PROCTORS, in an univerſity, are two officers choſen from among the ſtudents to ſee good order and exerciſes daily performed.

PROCURATION, or PROCURACY, an act or inſtrument by which a perſon is impowered to treat, tranſact, receive, &c. in another perſon's name. This word is is now little uſed in this ſenſe, except in the caſe of a perſon who collects the fruits of a benefice for another.

The ſame word is uſed for certain ſums of money annually paid by pariſh-prieſts to the biſhop or archdeacon, on account of viſitation, and which, in former times, were paid in neceſſary victuals and proviſions for the viſitor and his attendants.

PROCURATOR, a perſon who has a charge committed to him, to act for another.

Thus the proxies of the lords in parliament are, in our law books, called procurators: the biſhops are ſometimes called *procuratores eccleſiarum*; and the repreſentatives ſent by the clergy to convocation, *procuratores clerici*. The word is alſo uſed for a vicar or lieutenant; and we read of a procurator regni, who was an antient magiſtrate. Thoſe who manage cauſes in Doctor's commons are alſo called procurators or proctors. In our ſtatutes, he who gathers the fruits of a benefice for another is particularly called a procurator, and the inſtrument impowering him to receive them is termed procuracy.

PROCURATOR, is alſo a kind of magiſtrate in ſeveral cities in Italy, as the procurators of St. Mark at Venice, Genoa, &c. The procurators of St. Mark are the adminiſtrators of the church, and of the revenues attached to it: they are the patrons of orphans, and the executors of teſtaments, and are cloathed in black velvet with duſky ſleeves.

PROCYON, in aſtronomy, a fixed ſtar of the ſecond magnitude in the conſtellation called canis minor. See CANIS.

PRODICTATOR, in roman antiquity, a magiſtrate who had the power, and did the office, of a dictator. See the article DICTATOR.

They ſometimes created this magiſtrate where they could not have a dictator.

PRODUCING, in geometry, ſignifies drawing out a line farther till it have an aſſigned length.

PRODUCT, in arithmetic and geometry, the factum of two or more numbers, lines, &c. into one another: thus $5 \times 4 = 20$, the product required.

In lines it is always (and in numbers ſometimes) called the rectangle between the two lines, or numbers, multiplied into one another.

PRODUCTION, in anatomy, the ſame with proceſs. See PROCESS.

PROEM, a term ſometimes uſed for prelude or preface. See the articles PRELUDE and PREFACE.

ROEMPTOSIS, in aſtronomy, the appearance of the new moon a day later, by reaſon of the lunar equation. See the article MOON.

ROFANATION, the acting diſreſpectfully to ſacred things.

ROFANE, a term uſed in oppoſition to holy, and, in general, is applied to all perſons who have not the ſacred character, and to things which do not belong to the ſervice of religion.

ROFER, in law, the time appointed for the accounts of ſheriffs, and other officers, to be given in to the Exchequer, which ſhould be twice a year, by ſtat. 51 Hen. III.

It alſo denotes an offer, or endeavour, to proceed in an action by a perſon concerned ſo to do.

ROFESSION, *profeſſio*, among the Romaniſts, denotes the entering into a religious order, whereby a perſon offers himſelf to God, by a vow of inviolably obſerving obedience, chaſtity, and poverty.

ROFESSOR, in the univerſities, a perſon who teaches or reads public lectures in ſome art or ſcience from a chair for the purpoſe.

In the foreign and ſcottiſh univerſities, profeſſors teach the arts, and have their claſſes of pupils; but thoſe in England only read public lectures in term-time.

Some profeſſors are denominated from the arts they profeſs, others from the founders of the profeſſorſhips, or thoſe who aſſigned a revenue for the ſupport of the profeſſors. Such are the ſavilian profeſſors, at Oxford; the lucaſian, at Cambridge; and the regius profeſſors for reading lectures in each of our univerſities, on divinity, hebrew, greek, law, and phyſic: ſo called from theſe lectures being founded by king Henry VIII.

OFILE, in architecture, the draught of a building, fortification, *&c.* wherein are expreſſed the ſeveral heights, widths, and thickneſſes, ſuch as they would appear, were the building cut down perpendicularly from the roof to the foundation. It is alſo called ſection, orthographical ſection, and, by Vitruvius, ſciagraphy. This is the ſame as elevation, in oppoſition to a plan, ichnography. See the article FORTIFICATION.

PROFILE alſo denotes the outline of a figure, building, member of architecture, *&c.* Hence profiling ſometimes denotes deſigning or deſcribing the member with a rule, compaſs, *&c.*

PROFILE, in ſculpture and painting, denotes a head, portrait, *&c.* when repreſented ſide-ways, or in a ſide view. On almoſt all medals, faces are repreſented in profile.

PROFLUVIUM, in medicine, denotes a flux, or liquid evacuation, of any thing. See the article FLUX.

PROGNOSTICS, προγνωσις, among phyſicians, ſignifies a judgment concerning the event of a diſeaſe, as whether it ſhall end in life or death, be ſhort or long, mild or malignant, *&c.* See the articles DISEASE, SIGN, and INDICATION.

A prudent phyſician will be very cautious in delivering his prognoſtic, and not, like bold quacks, promiſe all will go well, whether the caſe is curable or not. He ought to avoid both extremes, and to declare from his conſcience what he takes to be the true ſtate of the patient; only in dangerous caſes he ſhould do it to the relations, and at the ſame time tell his reaſons both for hope and fear; for as to the patient himſelf, it is proper to cheriſh him with hopes of a recovery, both becauſe ſome diſorders are much aggravated by fear, and the expectation of future health and eaſe has often a happy effect.

PROGRAMMA, antiently ſignified a letter, ſealed with the king's ſeal.

Programma is alſo an univerſity-term for a billet or advertiſement, poſted up, or given into the hand, by way of invitation to an oration, *&c.* containing the argument, or ſo much as is neceſſary for underſtanding thereof.

PROGRESSION, in general, denotes a regular advancing, or going forward, in the ſame courſe and manner.

PROGRESSION, in mathematics, is either arithmetical or geometrical. Continued arithmetic proportion, where the terms do increaſe and decreaſe by equal differences, is called arithmetic progreſſion:

thus $\left\{\begin{matrix} a, a+d, a+2d, a+3d, \&c. \text{ increaſing} \\ a, a-d, a-2d, a-3d, \&c. \text{ decreaſing} \end{matrix}\right\}$ by the difference d.

In numbers $\left\{\begin{matrix} 2, 4, 6, 8, 10, \&c. \text{ increaſing} \\ 10, 8, 6, 4, 2, \&c. \text{ decreaſing} \end{matrix}\right\}$ by the difference 2.

But ſince this progreſſion is only a compound of two ſeries, *viz.*

of $\left\{\begin{matrix} \text{Equals} \\ \text{Arith. proportionals} \end{matrix}\right.$ $\begin{matrix} a, & a, & a, & a, & a, \\ 0, & \pm d, & \pm 2d, & \pm 3d, & \pm 4d, \end{matrix}$ $\left.\begin{matrix} \\ \end{matrix}\right\}$ *&c.*

Therefore the moſt natural arithmetic progreſſion is that which begins with 0: a

$$0, \pm d, \pm 2d, \pm 3d, \pm 4d, \begin{cases} \text{increaſing.} \\ \text{decreaſing.} \end{cases}$$

In any arithmetical progreſſion,

If $\left\{\begin{matrix} a \\ d \\ n \\ l \\ s \end{matrix}\right\}$ be the $\left\{\begin{matrix} \text{firſt term} \\ \text{common difference,} \\ \text{number of terms,} \\ \text{laſt term,} \\ \text{ſum of all the terms;} \end{matrix}\right\}$ then any three of theſe terms being given, the other two are eaſily found.

And the ſeveral caſes are reducible into ten propoſitions, which are all ſolved by the two following lemmata.

Lemma I. In any arithmetic progreſſion, it is, $1 : \frac{n}{2} :: a + l : s$

$$\text{For } \left\{\begin{matrix} a \\ a+d \\ a+2d \\ a+3d \\ \&c. \end{matrix}\right\} + \left\{\begin{matrix} l \\ l-d \\ l-2d \\ l-3d \\ \&c. \end{matrix}\right\} = \left\{\begin{matrix} a+l \\ a+l \\ a+l \\ a+l \\ \&c. \end{matrix}\right\}$$

Therefore $s + s = \overline{a+l} \times n$. That is, $2s = \overline{a+l} \times n$. Conſequently, $1 : \frac{n}{2} :: a + l : s$.

From this the following corollaries naturally follow.

Cor. I. $a = \frac{2s}{n} - l = \frac{2s - nl}{n} = 2s - nl \times \frac{1}{n}$

Cor. II. $n = \frac{2s}{a+l} = 2 \times \frac{s}{a+l} = 2s \times \frac{1}{a+l}$.

Cor. III. $l = \frac{2s}{n} - a = \frac{2s - na}{n} = 2s - na \times \frac{1}{n}$.

Cor. IV. $s = \frac{n}{2} \times \overline{a+l} = \frac{n \times \overline{a+l}}{2} = \frac{na+nl}{2} = n \times \frac{a+l}{2}$.

Lemma II. In any arithmetic progreſſion it is $1 : n-1 :: d : l-a$.

For, $a, a+d, a+2d, a+3d, a+\overline{n-1} \times d = l$. That is, $\overline{n-1} \times d = l - a$, by tranſpoſition. Therefore, $1 : n-1 :: d : l-a$. From this likewiſe the four following corollaries are deduced.

Cor. I. $a = l - \overline{n-1} \times d = l - nd + d$.

Cor. II. $n = \frac{l-a}{d} + 1 = \frac{l-a+d}{d}$.

Cor. III. $d = \frac{l-a}{n-1} = l - a \times \frac{1}{n-1}$.

Cor. IV. $l = a + \overline{n-1} \times d = a + nd - d$.

Prop. I. Given $a = 2 =$ the firſt term, $d = 2 =$ the common difference, $n = 15 =$ the number of terms; required $l =$ the laſt term, and $s =$ the ſum of all the terms.

Solution. 1. $l = a + nd - d = \frac{2s - na}{n} = 30$ by Lem. I. and II.

Then, $na + nnd - nd = 2s - na$; and $2s = 2na + nnd - nd$, by tranſpoſition.

2. Therefore, $s = na + \frac{nnd - nd}{2}$ by di viſion $= 240$.

Prop. II. Given a, d, l; required n,

Solution. 1. $n = \frac{l-a+d}{d} = \frac{2s}{a+l}$ by Lem I. and II.

Then, $2ds = ll + ld - a^2 + ad$, by mu tiplication.

2. Therefore, $s = \frac{ll + ld - a^2 + ad}{2d}$ by di viſion.

Prop. III. Given a, d, s; required n,

Solution. Since $l = \frac{2s - na}{n} = a + nd -$ by Lem. I, and II.

Therefore, $nnd + 2na - nd = 2s$, multiplication and tranſpoſition.

And $nn + \frac{2a-d}{d} n = \frac{2s}{d}$ by diviſion.

1. Then, $n = \frac{\sqrt{aa + \frac{1}{2}dd - ad + 2ds} -}{d}$ $+ \frac{1}{2}$.

And becauſe $n = \frac{2s}{a+l} = \frac{l-a+d}{d}$ by Le I. and II.

Therefore, $ll + dl = 2ds - ad + aa$, multiplication and tranſpoſition.

2. Then $l = \sqrt{2ds - ad + aa + \frac{1}{4}d$ $- \frac{1}{2}d$, by compleating the ſquare evolution.

Prop. IV. Given a, l, s; required n,

Solution. 1. $n = \frac{2s}{l+a} = \frac{l-a+d}{d}$ by Le I. and II.

Then, $2ds - ld - ad = ll - aa$, by m tiplication and tranſpoſition.

2. Therefore, $d = \frac{ll - aa}{2s - l - a}$ by divi

Prop. V. Given a, n, s; required l,

Solution. 1. $l = \frac{2s - na}{n} = a + nd -$ Lem. I. and II.

Then $nnd - nd = 2s - 2na$ by m tiplication and tranſpoſition.

2. Therefore, $d = \frac{2s - 2na}{nn - n}$, by ſion.

Prop. VI. Given a, n, l; required

Solution. 1. $d = \frac{l-a}{n-1} = l - a \times \frac{1}{n-1}$ Lem. II.

2. $s = \frac{na+nl}{2} = \overline{a+l} \times \frac{n}{2}$, by Lem. I.

Prop. VII. Given d, l, n; required a, s.

Solution. 1. $a = l - nd + d = \frac{2s-nl}{n}$ by Lem. II. and I.

Then, $2s = 2nl - nnd + nd$, by multiplication and tranſpoſition.

2. Therefore, $s = \frac{2nl - nnd + nd}{2}$, by diviſion.

Prop. VIII. Given d, n, s; required a, l.

Solution. Since $l = a + nd - d = \frac{2s-na}{n}$ by Lem. II. and I.

Then, $2na = 2s - nnd + nd$, by multiplication and tranſpoſition.

1. Therefore, $a = \frac{2s - nnd + nd}{2n}$, by diviſion.

And, ſince $a = l - nd + d = \frac{2s-nl}{n}$, by Lem. II. and I.

Then, $2nl = 2s + nnd - nd$, by multiplication and tranſpoſition.

2. Therefore, $l = \frac{2s + nnd - nd}{2n}$, by diviſion.

Prop. IX. Given d, l, s; required a, n.

Solution. Since $n = \frac{2s}{a+l} = \frac{l-a+d}{d}$, by Lem. I. and II.

Then $aa - ad = ll + ld - 2ds$, by multiplication and tranſpoſition.

1. Therefore, $a = \pm\sqrt{ll + ld - 2ds + \frac{1}{4}dd} + \frac{1}{2}d$.

And becauſe $a = l - nd + d = \frac{2s-nl}{n}$, by Lem. II. and I.

Therefore $-nnd + 2nl + nd = 2s$, by multiplication and tranſpoſition.

And $-nn + \frac{2l+d}{d}n = \frac{2s}{d}$, by diviſion.

2. Then, $n = \frac{1}{2} + \frac{l \pm \sqrt{ll + \frac{1}{4}dd + ld - 2ds}}{d}$

Prop. X. Given n, l, s; required a, d.

Solution. 1. $a = \frac{2s-nl}{n} = l - nd + d$, by Lem. I. and II.

Then, $2nl - 2s = nnd - nd$, by multiplication and tranſpoſition.

2. Therefore, $d = \frac{2nl - 2s}{nn - n}$, by diviſion.

To find the ſum of the powers of any arithmetic PROGRESSION.

Preparation. Suppoſe n the index of the power.

Let each term of the progreſſion be raiſed to each power, under that whoſe ſum is ſought. And let the ſum of each rank ſo raiſed, be multiplied by the multiple of the like dimenſion of a in $\overline{a+d}^{n+1}$. Put z for the ſum of all the products.

And m for the multiple of a^n, in the power $\overline{a+d}^{n+1}$

Solution.

Then $\frac{\overline{l+d}^{n+1} - a^{n+1} + nd^{n+1} + z}{m}$

is the ſum of any ſeries of powers, whoſe roots are arithmetically proportional. For ſuppoſe the ſum of the cubes of this arithmetic progreſſion a, $a+d$, $a+2d$, $a+3d$, was required.

1. $\overline{a+d}^{n+1} = \overline{a+d}^{4} = a^4 + 4a^3d + 6a^2d^2 + 4ad^3 + d^4$, and the ſum of this ſeries is $4a+6d$. Which multiply by $4d^3$ (the multiple of a into $\overline{a+d}^{3+1}$) the product will be $16ad^3 + 24d^4$. Alſo the ſum of their ſquares is $4a^2 + 12ad + 14d^2$. Which multiply by $6d^2$ (the multiple of a^2 in $\overline{a+d}^{3+1}$) the product will be $24a^2d^2 + 72ad^3 + 84d^4$.

Therefore $z = 24a^2d^2 + 88ad^3 + 108d^4 =$ ſum of theſe products

To which add $a^4 + 4d^4$ $(= a^{3+1} + nd^{3+1})$

The ſum is $a^4 + 24a^2d^2 + 88ad^3 + 112d^4$ $(= a^{n+1} + nd^{n+1} + z)$

From $\overline{l+d}^{n+1} = \overline{a+4d^4} = a^4 + 16a^3d + 96a^2d^2 + 256ad^3 + 256d^4$

Subtract $a^{n+1} + nd^{n+1} + z = a^4 * + 24a^2d^2 + 88ad^3 + 112d^4$

Then $\overline{l+d}^{n+1} - a^{n+1} + nd^{n+1} + z = 16a^3d + 72a^2d^2 + 168ad^3 + 144d^4$.

And $\frac{16a^3d + 72a^2d^2 + 168ad^3 + 144d^4}{(m=)\ 4d} = 4a^3 + 18a^2d + 42ad^2 + 36d^3$, the ſum of the cubes of the given cubes of the given terms. Becauſe

The cube of $\left\{\begin{matrix} a \\ a+d \\ a+2d \\ a+3d \end{matrix}\right\}$ is $\left\{\begin{matrix} a^3 \\ a^3 + 3a^2d + 3ad^2 + d^3 \\ a^3 + 6a^2d + 12ad^2 + 8d^3 \\ a^3 + 9a^2d + 27ad^2 + 27d^3 \end{matrix}\right.$

The ſum is $4a^3 + 18a^2d + 42ad^2 + 36d^3$

The

The ſame with the quotient before found. It is the ſame in any other ſeries for any other power.

Geometric PROGRESSION, or continued geometric proportion, is when the terms do increaſe or decreaſe by equal ratios: thus,

$a, ar, arr, arrr$, &c. increaſing
$a, \frac{a}{r}, \frac{a}{rr}, \frac{a}{rrr}$, &c. decreaſing
} from a continual { multiplication / diviſion } by r.

2, 4, 8, 16, 32, 64, increaſing
64, 32, 16, 8, 4, 2, decreaſing
} from a continual { multiplication / diviſion } by 2.

But ſince this progreſſion is only a compound of two ſeries, *viz.*

of { Equals $a, a, a, a, a, a,$ / Geometric proportion, $1, r, r^2, r^3, r^4, r^5,$ } &c.

therefore the moſt natural progreſſion is that which begins with unity.

as $\frac{1}{1}, \frac{r}{1}, \frac{r^2}{1}, \frac{r^3}{1}, \frac{r^4}{1}, \frac{r^5}{1}$ } &c. increaſing.
that is, $1. r, r^2, r^3, r^4, r^5$

as $\frac{1}{1}, \frac{1}{r}, \frac{1}{r^2}, \frac{1}{r^3}, \frac{1}{r^4}, \frac{1}{r^5}$ } &c. decreaſing.
that is, $1, r^{-1}, r^{-2}, r^{-3}, r^{-4}, r^{-5}$

In geometric progreſſion,

If { a / r / n / l / s } be the { firſt term, / the ratio, / number of terms, / laſt term, / ſum of all the terms; } then any three of theſe terms being given the other two are eaſily found.

And the ſeveral caſes are reducible to ten propoſitions, which are ſolved by the two following lemmata.

Of increaſing progreſſions.

Lem. I. In an increaſing geometric progreſſion $a, ar, ar^2, ar^3, ar^4, ar^5$, &c. it is $1 : r :: s-l : s-a$.

For $a : ar :: s-l : s-a$.
But $a : ar :: 1 : r$
Therefore $1 : r :: s-l : s-a$.

Cor. 1. $s = \frac{rl-a}{r-1} = \frac{l-a}{r-1} + l$.

Cor. 2. $r = \frac{s-a}{s-l} = s-a \times \frac{1}{s-l}$.

Cor. 3. $a = s + rl - rs = rl - s \times \overline{r-1}$.

Cor. 4. $l = \frac{rs-s+a}{r} = \frac{a+\overline{r-1} \times s}{r} = s - \frac{s-a}{r}$.

Lem. II. In an increaſing geometric progreſſion it is $1 : r^{n-1} :: a : l$.

For a, ar, ar^2, ar^3, ar^4, &c. $ar^{n-1} = l$.
Therefore $1 : r^{n-1} :: a : l$.

Cor. 1. $l = ar^{n-1} = a \times r^{n-1}$.

Cor. 2. $a = \frac{l}{r^{n-1}} = l \times \frac{1}{r^{n-1}}$.

Cor. 3. $n = \frac{\text{L.}r^{n-1}}{\text{L.}r} + 1 = \frac{\text{L.}l - \text{L.}a}{\text{L.}r} + 1$; that is, the logarithm of l — the logarithm of a, divided by the logarithm of r.

Cor. 4. $r = \overline{l \div a}^{\frac{1}{n-1}}$.

Prop. I. Given a, r, n, required l, s.

1. $l = ar^{n-1} = a \times r^{n-1}$, by Lem. II.

But $s = \frac{rl-a}{r-1}$, by Lem. I. and $r \times l = ar^n$, by multiplication.

2. Therefore $s = \frac{ar^n - a}{r-1}$ $(= a \times \frac{r^{n-1}}{r-1}$ by ſubſtitution.

Prop. II. Given a, r, l; required s, n.

1. $s = \frac{rl-a}{r-1} = \frac{l-a}{r-1} + l$, by Lem. I.

2. $n = \frac{\text{L.}l - \text{L.}a}{\text{L.}r} + 1$. by Lem. II.

Prop. III. Given a, r, s; required l, n.

1. $l = \frac{\overline{r-1} \times s + a}{r} = ar^{n-1}$, by Lem. I. and II.

Then $\overline{r-1} \times s + a = r \times ar^{n-1} = ar^n$, by multiplication.

And $r^n = \frac{\overline{r-1} \times s + a}{a}$, by diviſion.

$n\text{L.}r = \text{L.}\frac{\overline{r-1} \times s + a}{a}$.

2. Therefore $n = \frac{\text{L.}\overline{r-1} \times s + a - \text{L.}a}{\text{L.}r}$ by diviſion.

Pro

Prop. IV. Given a, l, s; required r, n.

1. $r = \frac{s-a}{s-l} = \overline{s-a} \times \frac{1}{s-l}$, by Lem. I.

2. $n = \frac{\text{L.}\,l - \text{L.}\,a}{\text{L.}\,r} + 1 = \frac{\text{L.}\,l - \text{L.}\,a}{\text{L.}\,\overline{s-a} - \text{L.}\,\overline{s-l}} + 1$, by Lem. II.

Prop. V. Given a, n, s; required r, l.

Since $\frac{sr-s+a}{r} = l = ar^{n-1}$, by Lem. I. and II.

Then $sr - ar^n = s - a$, by diviſion and tranſpoſition.

1. Therefore, $-r^n + \frac{s}{a}r = \frac{s-a}{a} = \frac{s}{a} - 1$, by diviſion.

And ſince $l = ar^{n-1}$, and $r = \frac{s-a}{s-l}$;

therefore $l = a \times \overline{\frac{s-a}{s-l}}^{n-1}$.

2. Theref. $l \times \overline{s-l}^{n-1} = a \times \overline{s-a}^{n-1}$ by multiplication.

Prop. VI. Given a, n, l; required r, s.

1. $r = \overline{l \div a}^{\frac{1}{n-1}}$, by Lem. II. But $\frac{l-a}{r-1} + l = s$, by Lem. I.

2. Therefore $s = \frac{l-a}{\overline{l \div a}^{\frac{1}{n-1}} - 1} + l$, by ſubſtitution.

Prop. VII. Given r, n, l; required a, s.

1. $a = \frac{l}{r^{n-1}}$, by Lem. II. But $\frac{lr-a}{r-1} = s$, by Lem. I.

2. Therefore $s = \frac{lr - \frac{l}{r^{n-1}}}{r-1} = \frac{lr^n - l}{r^n - r^{n-1}}$ by ſubſtitution.

Prop. VIII. Given r, s, n; required a, l.

Since $sr - s + a = ar^n$, by Lemma I. and II.

Then $sr - s = ar^n - a \left(= a \times r^n - 1\right)$ by tranſpoſition.

1. Therefore $a = \frac{sr-s}{r^n-1} = \frac{r-1}{r^n-1} \times s$, by diviſion.

And ſince $s = \frac{lr^n - l}{r^n - r^{n-1}}$, by Prop. VII.

Therefore $sr^n - sr^{n-1} = lr^n - l$.

2. Therefore $l = \frac{sr^n - sr^{n-1}}{r^n - 1}$, by diviſion,

Prop. IX. Given r, l, s; required a, n.

1. $a = s + rl - rs = lr - s \times \overline{r-1}$, by Lem. I.

But $\frac{l}{a} = \left(\frac{l}{s+rl-rs}\right) = r^{n-1}$ by Lemma II.

And $\text{L.}\frac{l}{s+rl-rs} = \overline{n-1}\,\text{L.}\,r$, by the nature of logarithms.

2. Therefore $n = \frac{\text{L.}\,l - \text{L.}\,\overline{s+rl-rs}}{\text{L.}\,r} + 1$, by diviſion and tranſpoſition.

Prop. X. Given n, l, s; required r, a.

Since $sr^n - sr^{n-1} = lr^n - l$, by Propoſition VIII.

Then $l = sr^{n-1} - sr^n + lr^n \left(= sr^{n-1} - s + l \times r^n\right)$ by tranſpoſition.

1. Therefore $-r^n + \frac{s}{s-l}r^{n-1} \left(= \frac{s}{s-l} r^{n-1} - r^n\right) = \frac{l}{s-l}$.

2. $a \times \overline{s-a}^{n-1} = l \times \overline{s-l}^{n-1}$, by Propoſition V.

Of decreaſing geometric progreſſions.

In finite decreaſing progreſſions, the ſame rules will ſerve for the like propoſitions, if the ſeries be inverted, ſo that the leaſt term be the firſt, and the greateſt the laſt. And ſince in the increaſing progreſſion it is $r-1 : 1 :: l-a : s-l$; therefore in a decreaſing geometric proportion it is $r-1 : 1 :: a-l : s-a$, by inverting the terms.

Cor. I. But in an infinite decreaſing progreſſion $l = 0$; therefore $r-1 : 1 :: a : s-a$. Whence,

Prop.	Given.	Required.	Solution.
1.	a	s	$ra \div r-1$
2.	s, a	r	$s \div s-a$
3.	s, r	a	$s - s \div r$

Cor. II. Alſo $a - \frac{a}{r} : \frac{a}{r}$ (that is, 1ſt − 2d : 2d, or x) $:: r-1 : 1$,

Therefore $a - x : x \left\{\begin{matrix} a-l \\ a \end{matrix}\right\} : s-a$ in $\left\{\begin{matrix} \text{a finite} \\ \text{an infinite} \end{matrix}\right\}$ progreſſion.

And $s = \frac{aa - xl}{a-x}$ in a finite, or $s = \frac{aa}{a-x}$ in an infinite decreaſing progreſſion.

Queſtion. Suppoſe a body ſhould move at this rate, *viz.* in the firſt moment 10 miles, in the ſecond 9 miles, in the third $8\frac{1}{10}$, &c. eternally, as 10 to 9.

Here is given $r = \frac{10}{9}$, $a = 10$; required s. Then, by

Cor.

Cor. $\left\{\begin{matrix}\text{I.}\\\text{II.}\end{matrix}\right\} s = \left\{\begin{matrix}ra \div \overline{r-1}\\aa \div \overline{a-x}\end{matrix}\right\}$ = 100miles ſought.

That is, a moveable body continuing its motion in that ratio eternally, would only run 100 miles, or more than any thing that is leſs than 100 miles.

Cor. III. Since $r-1 : 1 :: a : s-a$; therefore $s-a = \frac{a}{r-1} = a + \frac{a}{r} + \frac{a}{r^2} + \frac{a}{r^3}$, &c.

$-a = \frac{a}{r} + \frac{a}{r^2} + \frac{a}{r^3}$, &c.

Whence if any quantity a, be continually divided by any other quantity r, the ſum of all the terms will be $\frac{a}{r-1}$, that is, $\frac{1}{r-1} \times a$; or the $\frac{1}{r-1}$ of a. Therefore $a \times \frac{1}{r} + \frac{1}{r^2} + \frac{1}{r^3} + \frac{1}{r^4}$, &c. $= a \times \frac{1}{r-1}$. Or, $\frac{1}{r} + \frac{1}{r^2} + \frac{1}{r^3} + \frac{1}{r^4}$, &c. $= \frac{1}{r-1}$. Where, if $a = r-1$, then $s = 1$.

Whence, it is evident, that an infinite progreſſion, or an infinitely infinite one, may be collected into one ſum; which ſum may not be only finite, but equal to nothing. And of infinites it is hence plain, that ſome are equal, others unequal: and alſo, that one infinite may be equal to two or more finites, or infinites.

PROHIBITED GOODS, in commerce, the ſame with contraband goods. See the article CONTRABAND.

PROHIBITIO DE VASTO DIRECTA PARTE, in law, is a writ judicial directed to a tenant, prohibiting him from making waſte upon the land in controverſy during the ſuit.

This writ is alſo ſometimes directed to the ſheriff.

PROHIBITION, in law, is a writ that iſſues out of the chancery, king's bench, or common pleas, to prohibit ſome other court, either ſpiritual or ſecular, to proceed in a cauſe there depending, upon a ſuggeſtion that the cauſe does not belong to the court.

PROJECTILES, are ſuch bodies as being put in a violent motion by any great force, are then caſt off or let go from the place where they received their quantity of motion: as a ſtone thrown from a ſling, an arrow from a bow, a bullet from a gun, &c.

It is uſually taken for granted, by thoſe who treat of the motion of projectiles, that the force of gravity near the earth's ſurface is every where the ſame, and acts in parallel directions; and that the effect of the air's reſiſtance upon very heavy bodies, ſuch as bombs and cannon-balls, is too ſmall to be taken into conſideration.

The famous Sir Iſaac Newton has ſhewn, that the gravity of bodies which are above the ſuperficies of the earth, is reciprocally as the ſquares of their diſtances from its center; but the theorems concerning the deſcent of heavy bodies, demonſtrated by Gallilæus, and Huygens, and others, are built upon this foundation, that the action of gravity is the ſame at all diſtances: and the conſequences of this hypotheſis are found to be very nearly agreeable to experience. For it is obvious, that the error ariſing from the ſuppoſition of gravity's acting uniformly, and in parallel lines, muſt be exceeding ſmall; becauſe even the greateſt diſtance of a projectile above the ſurface of the earth, is inconſiderable, in compariſon of its diſtance from the center, to which the gravitation tends. But then, on the other hand, it is very certain, that the reſiſtance of the air to very ſwift motions, is much greater than it has been commonly repreſented. Nevertheleſs, (in the application of this doctrine to gunnery) if the amplitude of the projection, anſwering to one given elevation, be firſt found by experiment (which we ſuppoſe) the amplitudes in all other caſes, where the elevations and velocities do not very much differ from the firſt, may be determined, to a ſufficient degree of exactneſs, from the foregoing hypotheſis: becauſe, in all ſuch caſes, the effects of the reſiſtance will be nearly as the amplitudes themſelves; and were they accurately ſo, the proportions of the amplitudes, at different elevations, would then be the very ſame as in vacuo. See RESISTANCE.

Now, in order to form a clear idea of the ſubject here propoſed, the path of every projectile is to be conſidered as depending on two different forces; that is to ſay, on the impellant force, whereby the motion is firſt begun, (and would be continued in a right line) and on the force of gravity, by which the projectile during the whole time of its flight, is continually urged downwards, and made to deviate more and more from its firſt direction. As whatever relates to the track and flight of a projectile, or ball (neglecting the reſiſtance of the air) is to be determined from the action of the two forces, it will be proper, before we proceed

proceed to consider their joint effect, to premise something concerning the nature of the motion produced by each, when supposed to act alone, independent of the other; to which end we have premised the two following lemmata.

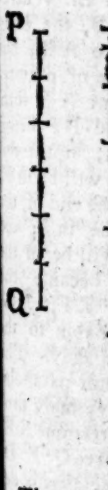
Lemma I. Every body, after the impressed force whereby it is put in motion ceases to act, continues to move uniformly in a right-line; unless it be interrupted by some other force or impediment.

This is a law of nature, and has its demonstration from experience and matter of fact.

Corollary. It follows from hence, that a ball, after leaving the mouth of the piece, would continue to move along the line of its first direction, and describe spaces therein proportional to the times of their description, were it not for the action of gravity; whereby the direction is changed, and the motion interrupted.

Lemma II. The motion, or velocity, acquired by a ball, in freely descending from rest, by the force of an uniform gravity, is as the time of the descent; and the space fallen through, as the square of that time.

The first part of this lemma is extremely obvious: for since every motion is proportional to the force whereby it is generated, that generated by the force of an uniform gravity, must be as the time of the descent; because the whole effort of such a force is proportional to the time of its action; that is, as the time of the descent.



To demonstrate that the distances descended are proportional to the squares of the times, let the time of falling thro' any proposed distance A B, be represented by the right line P Q; which conceive to be divided into an indefinite number of very small, equal, particles, represented each, by the symbol m; and let the distance descended in the first of them be A c; in the second cd; in the third de; and so on.

Then the velocity acquired being always as the time from the beginning of the descent, it will at the middle of the first of the said particles be represented by $\frac{1}{2}m$; at the middle of the second, by $1\frac{1}{2}m$; at the middle of the third, by $2\frac{1}{2}m$, &c. which values constitute the series $\frac{m}{2}, \frac{3m}{2}, \frac{5m}{2}, \frac{7m}{2}, \frac{9m}{2}$, &c.

But since the velocity, at the middle of any one of the said particles of time, is an exact mean between the velocities of the two extremes thereof, the corresponding particle of the distance A B, may be therefore considered as described with that mean velocity: and so, the spaces A c, cd, de, ef, &c. being respectively equal to the above-mentioned quantities $\frac{m}{2}, \frac{3m}{2}, \frac{5m}{2}, \frac{7m}{2}$, &c. it follows, by the continual addition of these, that the spaces A c, A d, A e, A f, &c. fallen through from the beginning, will be expressed by $\frac{m}{2}, \frac{4m}{2}, \frac{9m}{2}, \frac{16m}{2}, \frac{25m}{2}$, &c. which are evidently to one another in proportion, as, 1, 4, 9, 16, 25, &c. that is, as the squares of the times. *Q. E. D.*

Corollary. Seeing the velocity acquired in any number (n) of the aforesaid equal particles of time (measured by the space that would be described in one single particle) is represented by (n) times m, or nm; it will therefore be, as one particle of time, is to n such particles, so is nm, the said distance answering to the former time, to the distance, n^2m, corresponding to the latter, with the same celerity acquired at the end of the said n particles. Whence it appears that the space $\frac{n^2m}{2}$ (found above) through which the ball falls, in any given time n, is just the half of that (n^2m) which might be uniformly described with the last, or greatest celerity in the same time.

Scholium. It is found by experiment, that any heavy body, near the earth's surface (where the force of gravity may be considered as uniform) descends about 16 feet from rest, in the first second of time. Therefore, as the distances fallen through, are proved above to be in proportion; as the squares of the time. It follows that, as the square of one second, is to the square of any given number of seconds, so is 16 feet to the number of feet, a heavy body will freely descend in the said number of seconds. Whence the number of feet descended in any given time will be found, by multiplying the square of the number of seconds

conds by 16. Thus the diſtance deſcended in 2, 3, 4, 5, *&c.* ſeconds will appear to be 64, 144, 256, 400 feet, *&c.* reſpectively. Moreover, from hence, the time of the deſcent through any given diſtance will be obtained, by dividing the ſaid diſtance in feet, by 16, and extracting the ſquare root of the quotient; or, which comes to the ſame thing, by extracting the ſquare root of the whole diſtance, and then taking $\frac{1}{4}$ of that root for the number of ſeconds required. Thus, if the diſtance be ſuppoſed 2640 feet; then, by either of the two ways, the time of the deſcent will come out 12.84, or 12.50 ſeconds.

It appears alſo (from the corol.) that the velocity per ſecond (in feet) at the end of the fall, will be determined by multiplying the number of ſeconds in the fall by 32. Thus it is found that a ball at the end of 10 ſeconds, has acquired a velocity of 320 feet per ſecond. After the ſame manner, by having any two of the four following quantities, *viz.* the force, the times, the velocity, and diſtance, the other two may be determined: for let the ſpace freely deſcended by a ball, in the firſt ſecond of time (which is as the accelerating force) be denoted by F; alſo let T denote the number of ſeconds wherein any diſtance, D, is deſcended; and let V be the velocity per ſecond, at the end of the deſcent; then will

$$V = 2FT = 2\sqrt{FD} = \frac{2D}{T}$$

$$T = \sqrt{\frac{D}{F}} = \frac{V}{2F} = \frac{2D}{V}$$

$$D = FTT = \frac{VV}{4F} = \frac{TV}{2}$$

$$F = \frac{D}{TT} = \frac{V}{2T} = \frac{VV}{4D}$$

All which equations are very eaſily deduced from the two original ones, $D = FTT$, and $V = 2FT$, already demonſtrated; the former in the propoſition itſelf, and the latter in the corollary to it; by which it appears that the meaſure of the velocity at the end of the firſt ſecond is $2F$; whence the velocity (V) at the end of (T) ſeconds muſt conſequently be expreſſed by $2F \times T$ or $2FT$.

Theorem 1. A projected body, whoſe line of direction is parallel to the plane of the horizon, deſcribes by its fall a parabola.

If the heavy body is thrown by any extrinſecal force, as that of a gun or the like, from the point A, (plate CCXIII. fig. 3. n° 1.) ſo that the direction of its projection is the horizontal line AD; the path of this heavy body will be a ſemi-parabola. For if the air did not reſiſt it, nor was it acted on by its gravity, the projectile would proceed with an equable motion, always in the ſame direction; and the times wherein the parts of ſpace AB, AC, AD, AE, were paſſed over, would be as the ſpaces AB, AC, AD, *&c.* reſpectively. Now if the force of gravity is ſuppoſed to take place, and to act in the ſame tenour, as if the heavy body were not impelled by any extrinſecal force, that body would conſtantly decline from the right line AE; and the ſpaces of deſcent, or the deviations from the horizontal line AE, will be the ſame as if it had fallen perpendicularly. Wherefore if the body falling perpendicularly by the force of its gravity, paſſed over the ſpace AK in the time AB, deſcended thro' AL, in the time AC, and thro' AM in the time AD; the ſpaces AK, AL, AM, will be as the ſquares of the times, that is, as the ſquares of the right lines AB, AC, AD, *&c.* or KF, LG, MH. But ſince the impetus in the direction parallel to the horizon always remains the ſame; (for the force of gravity, that only ſolicites the body downwards, is not in the leaſt contrary to it;) the body will be equally promoted forwards in the direction parallel to the plane of the horizon, as if there was no gravity at all. Wherefore, ſince in the time AB, the body paſſes over a ſpace equal to AB; but being compelled by the force of gravity it declines from the right line AB thro' a ſpace equal to AK; and BF being equal and parallel to AK, at the end of the time AB, the body will be in F; ſo in the ſame manner, at the end of the time AE, the body will be in I; and the path of the projectile will be in the curve AFGHI; but becauſe the ſquares of the right lines KF, LG, MH, NI, are proportionable to the abſciſſes AK, AL, AM, AN. The curve AFGHI will be a ſemi-parabola. The path therefore of a heavy body projected according to the direction AE will be a ſemi-parabolical curve Q. E. D.

Theorem 2. The curve line, that is deſcribed by a heavy body projected obliquely and upwards, according to any direction, is a parabola.

Let AF (fig. *ibid.* n° 2.) be the direction of projection, any ways inclined to

the horizon, gravity being ſuppoſed not to act, the moving body would always continue its motion in the ſame right line, and would deſcribe the ſpaces AB, AC, AD, *&c.* proportional to the times. But by the action of gravity it is compelled continually to decline from the path AF, and to move in a curve, which will be a parabola. Let us ſuppoſe the heavy body falling perpendicularly in the time AB, through the ſpace AQ, and in the time AC, through the ſpace AR, *&c.* The ſpaces AQ, AR, AS, will be as the ſquares of the times, or as the ſquares of AB, AC, AD. It is manifeſt from what was demonſtrated in the laſt theorem, that if in the perpendicular BG, there is taken BM = AQ and the parallelogram be compleated, the place of the heavy body at the end of the time AB, will be M, and ſo of the reſt; and all the deviations BM, *&c.* from the right line AF, ariſing from the times, will be equal to the ſpaces AQ, AR, AS, which are as the ſquares of the right lines AB, AC, AD. Thro' A draw the horizontal right line AP, meeting the path of the projectile in P. From P raiſe the perpendicular PE, meeting the line of direction in E; and by reaſon the triangles ABG, ACH, *&c.* are equiangular, the ſquares of the right lines AB, AC, *&c.* will be proportionable to the ſquares of AG, AH, *&c.* ſo that the deviations BM, CN, *&c.* will be proportionable to the ſquares of the right lines AG, AH, *&c.* Let the line L be a third proportional to EP and AP; and it will be (by 17 El. 6) $L \times EP = APq.$ but $APq. : AGq. :: EP : BM :: L \times EP : L \times BM$; whence ſince it is $L \times EP = APq.$ it will be $L \times BM = AGq.$ In like manner it will be $L \times CN = AHq.$ *&c.* But becauſe it is BG : AG :: (EP : AP :: by hypotheſis) AP : L; it will be $L \times BG = AG \times AP = AG \times AG + AG \times GP = AGq. + AG \times GP$. But it has been ſhewn that it is $L \times BM = AGq.$ wherefore it will be $L \times BG - L \times BM = AG \times GP$, that is, $L \times MG = AG \times GP$. By the ſame way of reaſoning it will be $L \times NH = AH \times HP$, *&c.* Wherefore the rectangle under MG and L, will be equal to the ſquare of AG, which is the property of the parabola; and ſo the curve AMNOPK wherein the projectile is moved will be a parabola.

Cor. 1. Hence the right line L is the latus rectum or parameter of the parabola, that belongs to its axis.

Cor 2. Let AH = HP, and it will be $L \times CN = AHq. = L \times NH$, whence it will be NH = CN; and conſequently the right line AF being the line of direction of the projectile, will be a tangent to the parabola.

Cor 3. If a heavy body is projected downwards, in a direction oblique to the horizon; the path of the projectile will be a parabola.

Theorem 3. The impetus of a projected body in different parts of the parabola, are as the portions of the tangents intercepted betwixt two right lines parallel to the axis; that is, the impetus of the body projected in the points A and B, (*ibid.* n° 3.) to which AD, and BE are tangents, will be as CD, and EB, the portions of the tangents intercepted betwixt two right lines CB, and DE parallel to the axis.

We have here treated the path of a projected body as an exact parabola, though from the reſiſtance of the air, the line of a projectile is not exactly parabolical, but rather a kind of hyperbola; which, if conſidered and applied to practice, would render the computations far more operoſe, and the very ſmall difference (as experience ſhews in heavy ſhot) would, in a great meaſure, leſſen the elegancy of the demonſtrations given by accounting for it; ſince the common rules are ſufficiently exact, and eaſy for practice.

PROJECTION, in mechanics, the act of communicating motion to a body, from thence called projectile. See the preceding article.

In perſpective, projection is the appearance or repreſentation of an object on the perſpective plane. See PERSPECTIVE.

The projection of the ſphere is either orthographic, or ſtereographic. See the articles ORTHOGRAPHIC and STEREOGRAPHIC, MAP, *&c.*

The former, or orthographic projection ſuppoſes the eye placed at an infinite diſtance; whereas, in the ſtereographic projection, it is ſuppoſed to be only 90° diſtant from the primitive circle, or placed in its pole, and thence viewing the circles on the ſphere. The primitive circle is that great circle which limits or bounds the repreſentation or projection; and the place of the eye is called the projecting point.

The laws of the orthographic projection are theſe: 1. The rays by which the eye, placed at an infinite diſtance, perceives

any object are parallel. 2. A right line, perpendicular to the plane of the projection, is repreſented by a point, where it cuts the plane of the projection. 3. A right line, as A B, or C D, (pl. CCXIII. fig. 2. n° 1.) not perpendicular, is projected into a right line, as F E and G H, and is always comprehended between the extreme perpendiculars A F and B E, and C G and D H. 4. The projection of the right line, A B, is the greateſt when it is parallel to the plane of projection; being projected in a right line equal to itſelf. 5. But an oblique line is always projected into one leſs than itſelf; and the more ſo, the nearer it approaches to a perpendicular, which, as already obſerved, is projected into a point. 6. A plane ſurface, as A B C D, (*ibid.* n°. 2.) at right angles to the plane of the projection, is projected into the right line A B, in which it cuts the plane of the projection; and any arch as B *c*, *c c*, or *c* A, is projected into the correſponding lines B *o*, *o o*, and *o* A. 7. A circle parallel to the plane of projection, is repreſented by a circle equal to itſelf; and a circle oblique to the plane of projection, is repreſented by an ellipſis: for the method of putting theſe rules in practice, ſee the article MAP.

As to the ſtereographic projection, its laws are theſe: 1. The repreſentations of all circles, not paſſing thro' the projecting point, will be circles. Thus, let A C E D B (plate CCXII. fig. 1. 2, 3.) repreſent a ſphere, cut by a plane R S, paſſing through the center I, at right angles to the diameter E H, drawn from E the place of the eye; and let the ſection of the ſphere by the plane R S, be the circle C F D L, whoſe poles are H and E. Suppoſe now A G B is a circle on the ſphere to be projected, whoſe pole moſt remote from the eye is P; and the viſual rays form the circle A G B, meeting in E, form the cone A G B E, whereof the triangle A E B is a ſection thro' the vertex E, and diameter of the baſe A B: then will the figure *a g b f*, which is the projection of the circle A G B, be itſelf a circle: for if the plane R S is ſuppoſed to revolve on the line C D, till it coincides with the plane of the circle A C E B; then will the circle C F D L coincide with the circle C E D H, and the projected circle *a f b g* with the circle *a* N *b* K. Hence, the middle of the projected diameter, is the center of the projected circle, whether it be a great circle or a ſmall one; the poles and centers of all circles, parallel to the plane of projection, fall in the center of the projection; and all oblique great circles cut the primitive circle in two points diametrically oppoſite. 2. The projected diameter of any circle ſubtends an angle at the eye equal to the diſtance of that circle from its neareſt pole, taken on the ſphere; and that angle is biſſected by a right line, joining the eye and that pole. Thus let the plane R S (*ibid.* fig. 4.) cut the ſphere H F E G, thro' its center I; and let A B C be any oblique great circle, whoſe diameter A C is projected in *a c*; and K O L, any ſmall circle parallel to A B C, whoſe diameter K L is projected in *k l*. The diſtances of thoſe circles from their pole P, being the arches A HP, K HP; and the angles *a* E *c*, *k* E *l*, are the angles at the eye, ſubtended by their projected diameters, *a c*, *k l*. Then is the angle *a* E *c* meaſured by the arch A HP, and the angle *k* E *l* meaſured by the arch K HP, and thoſe angles are biſſected by E P. 3. Any point of a ſphere is projected at the diſtance of the tangent of half the arch intercepted between that point and the pole oppoſite to the eye, from the center of projection; the ſemi-diameter of the ſphere being radius. Thus, let C *b* E B (*ibid.* fig. 5.) be a great circle of the ſphere, whoſe center is *c*, G H the plane of projection cutting the diameter of the ſphere in *b*, B; E, C, the poles of the ſection by that plane; and *a*, the projection of A. Then is *c a* = the tangent of half the arch AC, as is evident by drawing C F = the tangent of half that arch, and joining *c* F. 4. The angle made by two projected circles, is equal to the angle which theſe circles make on the ſphere. For let I A C and A B L (*ibid.* fig. 6.) be two circles on a ſphere interſecting in A; E, the projecting point; and R S, the plane of projection, wherein the point A is projected in *a*, in the line I C the diameter of the circle A C E. Alſo let D H, F A, be tangents to the circles A C E, A B L. Then will the projected angle *d a f* be equal to the ſpheric angle B A C. 5. The diſtance between the poles of the primitive circle and an oblique circle, is equal to the tangent of half the inclination of thoſe circles; and the diſtance of their centers, is equal to the tangent of their inclination, the ſemi-diameter of the primitive being radius. For let A C (*ibid.* fig. 7.) be the diameter of a circle whoſe

BRITISH MUSEUM

Stereographic PROJECTION of the Sphere.

Fig. 1.

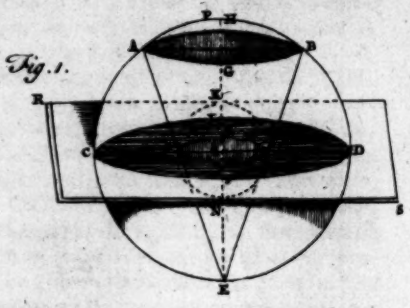


Fig. 2.

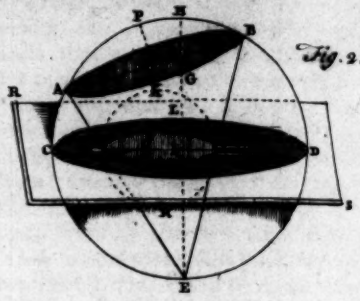


Fig. 3.

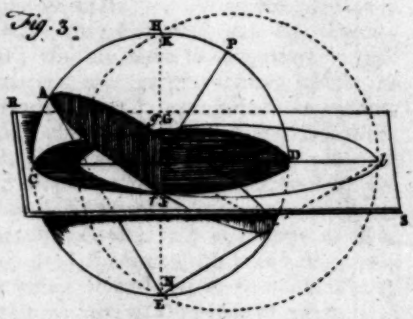


Fig. 4.

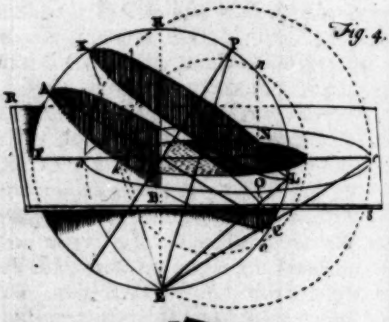


Fig. 5.

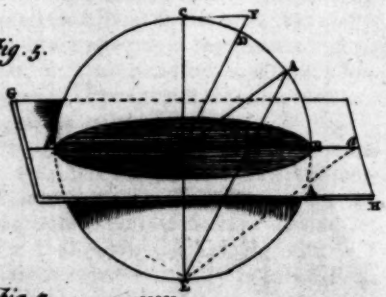


Fig. 6.

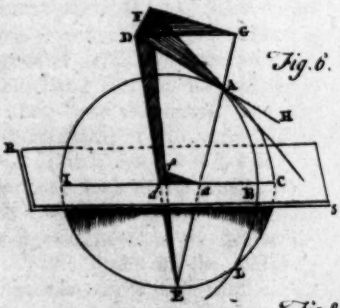


Fig. 7.

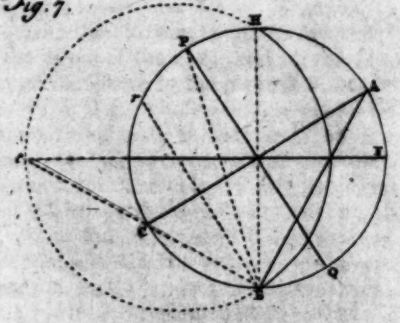


Fig. 8.

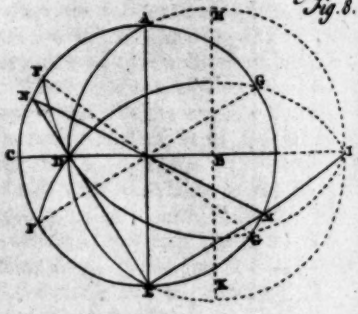


Fig. 9.

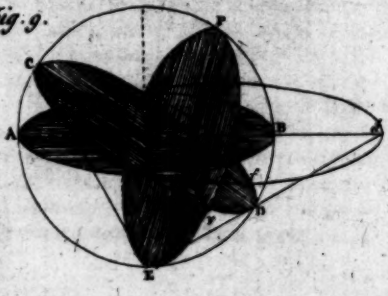
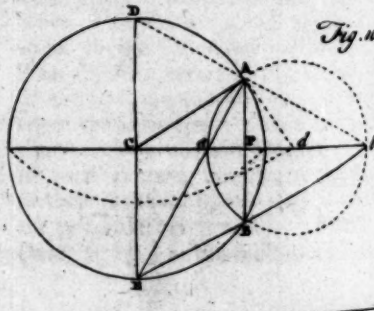


Fig. 10.



J. Jeffreys sc.

whose poles are P and Q, and inclined to the plane of projection in the angle AIF; and let *a*, *c*, *p*, be the projections of the points A, C, P; also let H*a*E be the projected oblique circle, whose center is *q*. Now when the plane of projection becomes the primitive circle, whose pole is I; then is I *p* = tangent of half the angle AIF, or of half the arch AF; and I *q* = tangent of AF, or of the angle FH*a* = AIF. 6. If thro' any given point in the primitive circle, an oblique circle be described; then the centers of all other oblique circles passing thro' that point, will be in a right line drawn thro' the center of the first oblique circle at right angles to a line passing thro' that center, the given point, and the center of the primitive: thus let GACE (*ibid.* fig. 8.) be the primitive circle, ADEI a great circle described thro' D, its center being B. HK is a right line drawn thro' B perpendicular to a right line, CI, passing thro' D, B, and the center of the primitive circle. Then the centers of all other great circles, as FDG, passing thro' D, will fall into the line HK. 7. Equal arches of any two great circles of the sphere, will be intercepted between two other circles drawn on the sphere thro' the remotest poles of those great circles. For let PBEA (*ibid.* fig. 9.) be a sphere, whereon AGB, CFD, are two great circles, whose remotest poles are E, P; and thro' these poles let the great circle PBEC, and the small circle PGE, be drawn, intersecting the great circles AGB, CFD, in the points B, G, and D, F. Then are the intercepted arches BG, and DF equal to one another. 8. If lines be drawn from the projected pole of any great circle, cutting the peripheries of the projected circle and plane of projection, the intercepted arches of those circumferences are equal; that is, the arch GB = *f d*, (*ibid.*) 9. The radius of any small circle, whose plane is perpendicular to that of the primitive circle, is equal to the tangent of that lesser circle's distance from its pole; and the secant of that distance, is equal to the distance of the centers of the primitive and lesser circle. For let P (*ibid.* fig. 10.) be the pole, and AB the diameter of a lesser circle, its plane being perpendicular to that of the primitive circle, whose center is C; then *d*, being the center of the projected lesser circle, *d a* is equal to the tangent of the arch PA, and *d*C = secant of PA.

PROJECTURE, in architecture, the outjetting, prominency, or embossing, which the mouldings, and other members, have beyond the naked wall, column, *&c.* and is always in proportion to its height. The word is also applied to galleries, balconies, *&c.* which jet out beyond the face of the wall. Vitruvius gives it as a general rule, that all projecting members in building have their projectures equal to their height; but this is not to be understood of particular members, or mouldings, as dentils, coronas, the fasciæ of architraves, the abacus of the Tuscan and Doric capital, *&c.* but only of the projectures of intire corniches. Some modern architects are of opinion that the great point in building consists in knowing how to vary the proportions of projectures agreeably to the circumstances of the building. Thus, they say, the nearness and remoteness, making a difference in the view, require different projectures; but it is plain, that the antients had no such intention. M. Perrault observes, that the projecture of the base and corniche, is greater in the antique than the modern building by one third; which seems to follow in a good measure from the antients proportioning the projecture to the height of the pedestal, whereas the moderns make the projecture the same in all the orders, though the height of the pedestal be very different.

PROINDIVISO, in law, is taken for a possession of lands, *&c.* belonging to two or more, whereof none of them can say which is his portion; each having the whole, *&c.* as copartners before partition.

PROLABIA, FORE-LIPS, a term in anatomy, for that part of the labia or lips which jets out.

PROLAPSUS, in surgery, a prolapsion, or falling out of any part of the body from its natural situation: thus we say prolapsus intestini, a prolapsion of the intestine, *&c.*

PROLAPSUS ANI, is such a prolapsion of the intestinum rectum, that it is frequently inverted, or prolapsed to such a degree both in adults and infants, as to appear near a handbreadth hanging out of its natural situation. Heister thinks, that the cause of this disorder may be a great weakness or relaxation in the rectum, which frequently happens to cross and

clamorous children, or from a teneſmus, violent pains of the piles, a dyſentery, a ſtone, or ulcer in the bladder, a difficult expulſion of the birth, or the fæces, &c. The diſorder is not difficult to cure when recent and the patient not weak; but in the contrary circumſtances, to effect a perfect cure is next to impoſſible. If a gangrene or cancer ſhould infect the rectum, as in ſuch caſes it may, the above mentioned author adviſes the application of diſcutient and emollient remedies; and if they prove unſucceſsful, an extirpation of the morbid part. The reduction of the inteſtine, which ſhould be effected as ſoon as poſſible, is done and retained in the ſame manner as is directed in returning and retaining the prolapſed inteſtines in wounds of the abdomen. See the article ABDOMEN.

PROLAPSUS OCULI, is a deſtemperature of the eye, in which it is ſo violently inflamed and ſwelled, that it cannot be contained in its orbit, but protrudes itſelf out of its natural ſeat. The cauſes of this diſorder are various, proceeding ſometimes from a violent inflammation, or a redundancy of humours in the eye, from an obſtruction of the reductory veſſels, and ſometimes from a ſcirrhus, cancer, or ſome external violence. When the diſorder is recent, and occaſioned by humours, they may be generally diſperſed according to Heiſter, by bleeding, purging, and veſicatories, with internal attenuants and diluents, and external diſcutient fomentations. But if the caſe is too obſtinate to yield to remedies, recourſe muſt be had to the chirurgical operation of the paracenteſis, as in other dropſical caſes. See PARACENTESIS.

At every dreſſing a concave plate of lead muſt be firmly ſecured upon the eye, till it recover its natural figure. After the paracenteſis, which our author chooſes to do in the ſclerotica, rather than the cornea, he dips his compreſs in ſpirit of wine. When the eye is infected even to the root with a ſcirrhus or cancer, there is no ſafer method of relieving the patient, than by extirpating it clean out of the orbit, deterging and healing the wound in the manner directed under the article WOUND.

PROLAPSUS INTESTINI, or a prolapſion of the inteſtine. See the articles ENTEROCELE and OSCHEOCELE.

PROLAPSUS OMENTI, or a falling of the omentum into the ſcrotum. See the article EPIPLOCELE.

PROLAPSUS UTERI, is when the uterus falls down and appears out of the vagina; whereas when it only deſcends into the vagina, it is termed a deſcent, or bearing down of the womb. The apparent and moſt general cauſe of a prolapſus uteri is from too great a relaxation and weakneſs of its ligatures, and of the vagina, and is obſerved moſt frequently to follow a difficult labour, or other violent ſtraining, tho' it may ſometimes happen even to maids and young girls: as to the other ſpecies of this diſorder called the deſcent of the womb, wherein the prolapſed uterus is inverted like a bag, ſo that its internal ſurface appears outermoſt, which at the ſame times lies concealed in the vagina, it is never obſerved but when the uterus is forced down together with the ſecundines, or after a difficult labour; and if it is not ſpeedily reduced, the caſe ſoon becomes paſt cure, and kills the patient. In order to reduce the uterus, after the patient has diſcharged her urine, ſhe is to be placed in a proper poſture, and carefully ſeparating the placenta, if it adheres to the uterus, the latter is to be replaced with the fingers, by returning the pendulous part firſt with the three middle fingers, and then with the whole hand into the cavity of the abdomen. When the parts have recovered their former ſituation, the patient is to keep in bed, lying on her back, with her legs cloſe together; and reſting in this poſture is of itſelf very often ſufficient: however it may not be improper to ſecure the womb from falling down again, either in coughing, ſneezing or otherwiſe, by retaining the lips of the pudenda together by a proper bandage. If there is an inflammation, bleeding and fomentation of the part with milk and water muſt be uſed. This diſorder is not ſo dangerous when the womb appears externally from a relaxation of its ligaments, but without inverſion, and not in the time of labour, as it is not likely to be attended with inflammation or mortification; but when it happens in a weak habit, it is often impracticable to ſuſtain it in its proper ſituation. In this caſe it muſt be aſſiſted by a proper bandage, and a retaining inſtrument internally, ſuch as a peſſary, or any other inſtrument for that purpoſe. See the article PESSARY.

PROLAPSUS VAGINÆ, or a bearing down of the vagina, is often confounded with the prolapſus uteri, inſomuch that they

are often called by the ſame name; not being eaſily diſtinguiſhable from each other. Heiſter takes a prolapſus of the vagina to happen when that body appears either wholly or in part without the labia pudendi; and a total prolapſion ſhews itſelf without the relaxed labia like a fleſhy ring, red or bloody, and ſwelled more or leſs, according to particular circumſtances. With regard to the treatment, when it is without inflammation the prolapſed parts ſhould be returned without the leaſt delay, to prevent any inflammation, ſcirrhus, or gangrene, after being fomented with ſome aſtringent and diſcutient liquor; after which the patient ſhould keep her bed for ſeveral days, retaining her thighs cloſe together without moving her body. In ſome caſes it will be proper to heat the patient with ſome mineral waters of the chalybeat kind, and ſome preparations of ſteel; but if the diſorder is inveterate, endeavours muſt be uſed to palliate it, by ordering the patient conſtantly to wear the T bandage. See the article BANDAGE.

If the prolapſed parts are inflamed, diſcutient fomentations and cataplaſms are to be applied externally, and bleeding and the other internal medicines directed under the article INFLAMMATION.

PROLAPSUS UVULÆ, a diſorder of the uvula, which is ſometimes ſo much enlarged and elongated as even to reach the larynx, and pharynx, and obſtruct the actions both of reſpiration and deglutition. If it proceeds from a recent inflammation, as may be judged from the pain, heat, and redneſs of the circumjacent parts, the patient may be relieved with cooling gargles, and injections of wine and water, or a decoction of proper herbs with a little alum; but at the ſame time proper coolers muſt be uſed internally, with bleeding, purges, and clyſters, to prevent the inflammation from ſpreading thro' the fauces, and exciting a quinſy. When this diſorder continues, notwithſtanding the uſe of remedies, it will be neceſſary, depreſſing the tongue with a ſpatula, to clip off the redundant part of the uvula with a pair of ſciſſars; after which the blood being permitted to run a little time, it may be reſtrained by a gargle of warm wine, vinegar, or if it ſtill continues, apply a little alum, or a cautery, till the hæmorrhage ceaſes.

PROLATE, in geometry, an epithet applied to a ſpheriod produced by the revolution of a ſemi-ellipſes about its larger diameter. See the articles ELLIPSIS and SPHEROID.

PROLATION, in muſic, the art of ſhaking or making ſeveral inflections of the voice or ſound on the ſame note or ſyllable. See the article SINGING.

PROLEGOMENA, in philology, certain preparatory obſervations or diſcourſes prefixed to a book, &c. containing ſomething neceſſary for the reader to be apprailed of, to enable him the better to underſtand the book, or to enter deeper into the ſcience, &c.

PROLEPSIS, προλημψις, a figure in rhetoric, by which we anticipate or prevent what might be objected by the adverſary; thus, *it may be objected*, &c.

PROLEPTIC, προληπτικος, an epithet applied to a periodical diſeaſe which anticipates, or whoſe paroxyſm returns ſooner and ſooner every time, as is frequently the caſe in agues.

PROLIFIC, ſomething that has the qualities neceſſary for generating. See the article FERTILITY.

PROLIXITY, in diſcourſe, the fault of entering into too minute a detail, of being too long, preciſe, and circumſtantial, even to a degree of tedioufneſs.

PROLOCUTOR *of the convocation*, the ſpeaker or chairman of that aſſembly. See the article CONVOCATION.

There are two prolocutors of the convocation, one of the higher houſe, and one of the lower: the prolocutor of the lower houſe, immediately upon their firſt aſſembling, is choſen by the members of that houſe, and preſented to the higher houſe as their prolocutor; that is, the perſon by whom they intend to deliver their reſolutions to the higher houſe, &c. and to have their own houſe eſpecially regulated: in which reſpect his office is to call the names of thoſe that are of the houſe, as he ſees cauſe, to read all things propounded, gather ſuffrages, &c. The archbiſhop of Canterbury is by virtue of his office prolocutor of the higher houſe of convocation.

PROLOGUE, *prologus*, in dramatic poetry, a diſcourſe addreſſed to the audience before the drama or play begins. The original intention was to advertiſe the audience of the ſubject of the piece, and to prepare them to enter more eaſily into the action, and ſometimes to make an apology for the poet. This laſt article ſeems intirely to have taken poſſeſſion of the prologue in the britiſh drama. The French have left off the uſe of prologues:

logues: thoſe few they uſe have nothing in them of the genuine prologue, as bearing no relation to the ſubject, but being mere flouriſhes of harangues in praiſe of the king, &c. In the antient theatre the prologus was properly the actor who rehearſed the prologue; the prologus was eſteemed one of the dramatis perſonæ, and never appeared in the piece in any other character: the prologue, therefore, among them, though not an eſſential, was yet an acceſſary part of the piece; with us it is no part at all, but ſomething intirely diſtinct and ſeparate: with them the drama was opened with the appearance of the prologus; with us it is not opened till after the prologus is retired. With us he always directs his ſpeech to the audience, conſidered as in a playhouſe; but with them he ought in propriety to have ſpoken to a chorus of byſtanders, or perſons to be preſent at the real action: but this being in a great meaſure inconſiſtent with the deſign of a prologue, it was directed to the audience. The prologue is of much more antient ſtanding than the epilogue. See the article EPILOGUE.

PROLUSION, in literature, a term applied to certain pieces or compoſitions made previouſly to others, by way of prelude or exerciſe: thus Diomedes calls the Culex of Virgil, and his other opuſcula, proluſions, becauſe written before the great ones.

PROM, a city of the kingdom of Ava, in the further India: eaſt long. 94°, north lat. 19°.

PROMETHEUS, in the antient aſtronomy, the name of the conſtellation now called hercules. See HERCULES.

PROMISE, in law, is when upon any valuable conſideration one binds himſelf by word of mouth to another to perform a thing agreed on. It is held upon ſuch a promiſe that action will lie for breach, which will not if the promiſe be without conſideration, that being a naked bargain, from which no action can ariſe. Here a promiſe againſt a promiſe made at one and the ſame time, is ſufficient ground for an action. In caſe a verbal promiſe is made to do a thing, and there is no breach thereof, the ſame may be diſcharged by parol, or by word of mouth; but if the promiſe be once broke, it may not be diſcharged without ſome receipt or releaſe: for it is then become a debt. When any action is grounded on a promiſe, there payment or other legal diſcharge ought to be pleaded. See the article BARGAIN.

PROMONTORY, in geography, a high point of land or rock projecting out into the ſea; the extremity of which towards the ſea, is called a cape, or headland.

PROMOTERS, *promotores*, in a legal ſenſe, are ſuch as in popular or penal actions proſecute offenders in their own names, and in that of the king's, as informers do; and who have part of the forfeitures or penalties for their reward. Theſe formerly belonged to the exchequer, but of late they have chiefly liſted themſelves under the banner of the exciſe.

PROMPT PAYMENT. See PAYMENT.

PROMPTER, in the drama, an officer poſted behind the ſcenes, whoſe buſineſs it is to watch attentively the actors ſpeaking on the ſtage, in order to ſuggeſt and put them forward, when at a ſtand, to correct them when amiſs, &c. in their parts.

PROMULGATED, or PROMULGED, ſomething publiſhed or proclaimed, and generally applied to a law, to denote the publiſhing or proclaiming it to the people.

PRONAOS, in the antient architecture, a porch to a church, palace, or other ſpacious building. See the article PORCH.

PRONATION, among anatomiſts. The radius of the arm has two kinds of motions, the one called pronation, the other ſupination. Pronation is that whereby the palm of the hand is turned downwards; and ſupination, the oppoſite motion thereto, is that whereby the back of the hand is turned downwards. The peculiar muſcles whereby pronation is performed are called pronatores, as thoſe by which ſupination is performed are termed ſupinatores. See SUPINATOR, and the next article.

PRONATORS, *pronatores*, in anatomy, two muſcles of the radius, which ſerve to turn the palm of the hand downwards, and are diſtinguiſhed by the names of rotundus and quadratus. The pronator quadratus, or tranſverſus, is a ſmall fleſhy muſcle, lying tranſverſely on the inſide of the lower extremity of the fore-arm. It is fixed by one ſide in the long eminence at the lower part of the internal angle of the ulna, and by the other in the concave ſide of the lower extremity of the radius. It is nearly as broad as it is long, and is wholly fleſhy, without any mixture of tendinous fibres. The

pronator

pronator rotundus, or obliquus, is a ſmall muſcle more broad than thick, ſituated on the upper part of the ulna, oppoſite to the ſupinator brevis. It is fixed to the internal condyle of the os humeri, and from thence paſſes obliquely before the extremity of the tendon of the brachiæus, and reaches to the middle part of the convex ſide of the radius, where it becomes flat, and is inſerted below the ſupinator brevis, by an extremity almoſt altogether fleſhy.

PRONG-HOE, in huſbandry, the name of an inſtrument uſed to hoe or break the ground near and among the roots of plants. The prong-hoe conſiſts of two hooked points, of ſix or ſeven inches length; and when ſtruck into the ground, will ſtir and remove it the ſame depth as the plough does; and thus anſwer both the ends of cutting up the weeds, and opening the land. The prong-hoe comes into excellent uſe, even in the horſe-hoeing huſbandry; and in this the hoe-plough can only come within three or four inches of the rows of the corn, turneps, and the like; but this inſtrument may be uſed afterwards; and with it the land may be raiſed and ſtirred, even to the very ſtalk of the plant. See the articles HOE, HOEING, and PLOUGH.

PRONOUN, *pronomen*, in grammar, a declinable part of ſpeech, which being put inſtead of a noun, points out ſome perſon, or thing.

Pronouns are divided into the ſix following claſſes, *viz.* demonſtrative pronouns; relative pronouns; poſſeſſive pronouns; gentile pronouns, or ſuch as denote a perſon's country, as *noſtras*, *veſtras*, and *cujas*; interrogative pronouns, and reciprocal pronouns. See the articles DEMONSTRATIVE, RELATIVE, *&c.*

PRONOUNCING, or PRONUNCIATION, in painting, the marking and expreſſing the parts of all kinds of bodies with that degree of force, neceſſary to make them more or leſs diſtinct and conſpicuous.

PRONUNCIATION, *pronunciatio*, in grammar, the manner of articulating or ſounding the words of a language.

Pronunciation makes much the moſt difficult part of a written grammar; in regard that a book expreſſing itſelf to the eyes, in a matter that wholly concerns the ears, ſeems next akin to that of teaching the blind to diſtinguiſh colours; hence it is that there is no part ſo defective in grammar as that of the pronunciation, as the writer has frequently no term whereby to give the reader an idea of the ſound he would expreſs; for want of a proper term, therefore, he ſubſtitutes a vicious and precarious one. To give a juſt idea of the pronunciation of a language, it ſeems neceſſary to fix as nearly as poſſible all the ſeveral ſounds employed in the pronunciation of that language. Cicero tells us, that the pronunciation underwent ſeveral changes among the Romans; and indeed it is more precarious in the living languages, being, as Du Bos tells us, ſubſervient to faſhion in theſe. The French language is clogged with a difficulty in pronunciation from which moſt others are free; and it conſiſts in this, that moſt of their words have two different pronunciations, the one in common proſe, the other in verſe. See the article FRENCH, *&c.*

As to the pronunciation of the engliſh language, the ingenious Mr. Martin, in his Spelling-Book of Arts and Sciences, lays down the following rules: 1. The final (*e*) lengthens the ſound of the foregoing vowel; as in *can*, *cane*; *rob*, *robe*; *tun*, *tune*, &c. 2. The final (*e*) in words ending in *re*, is ſounded before the *r* like *u*; as *maſſacre*, *maſſa-cur*; *lucre*, *lu-cur*, &c. 3. The latin diphthongs *æ*, *œ*, are ſounded like *e*; as *Ætna*, *Etna*; *oeconomy*, *economy*, &c. but at the end of words *oe* ſounds like *o*; as in *toe*, *foe*, &c. 4. Alſo the engliſh improper diphthongs, *ea*, *eo*, *eu*, *ue*, ſound only the *e* and *u*; as *tea* or *te*, *feoffee* or *feffee*, *due* or *du*, *true* or *tru*, &c. tho' ſometimes *eo* and *ea* are pronounced like *ee*, as in *people*, *fear*, *near*, &c. 5. Sometimes the diphthong (*ie*) is pronounced like *e* in *cieling*, like *ee* in *field*, and, at the end of words, always like *y*; as in *lie*, &c. and *ei* is pronounced either like *e* or *ai*; as in *deceit*, *reign*, &c. 6. The triphthong *eau* is pronounced like *o*, in *beau* and *jet d'eau*; and *ieu* ſounds like *u* in *lieu*, *adieu*, &c. 7. The ſound of *c* is hard before the vowels *a*, *o*, *u*; as in *call*, *cold*, *cup*, &c. alſo ſometimes before *h*, as in *chart*, *chord*, &c. and before *l* and *r*; as in *clear*, *creep*, &c. It is otherwiſe generally ſoft, as in *city*, *cell*, *cyder*, *child*, &c. 8. In french words *ch* is ſounded like *ſh*; as in *chagreen*, *machine*; and ſometimes like *qu*, as in *choir*. 9. The ſound of *g* is hard before *a*, *o*, *u*, *l*, *r*; as in *gall*, *go*, *gum*, *glean*, *grope*; alſo before *ui*, as in *guilt*, *guild*, &c. and before *h*, as in *ghoſt*; ſometimes before *i*, as in *gibbous*, *gibberiſh*. It is alſo

alſo generally hard before *e*; as in *get*, *geld*, &c. but ſoft in many words derived from the greek and latin, as in *geometry*, *genealogy*, *genus*, &c. Two *gg* are always hard, as in *dagger*, &c. The ſound of *g*, when ſoft, is like that of *j*. 10. In any part of a word, *ph* ſounds like *f*, as in *philoſophy*, &c. 11. The ſound of *qu*, at the end of french words, is like *k*, as in *riſque*, &c. 12. The ſyllables *ti* and *ci*, if followed by a vowel, ſound like *ſi* or *ſhi*; as in *fiction*, *logician*, &c. 13. When *cc* occurs before *i*, the firſt is hard and the latter is ſoft; as in *flaccid*, &c. 14. The latter *p* is not pronounced at the beginning of ſyllables, before *ſ* and *t*; as in *pſalm*, *ptarmics*, &c. As to other peculiarities, regarding the pronunciation of ſingle letters, many of them have been taken notice of at the beginning of each, in the courſe of this work.

But it is not enough to know the juſt pronunciation of ſingle letters, but alſo of words; in order to which, the accenting of words ought to be well underſtood; ſince nothing is more harſh and diſagreeable to the ear, than to hear a perſon ſpeak or read with wrong accents: and, indeed, in engliſh, the ſame word is often both a noun and a verb, diſtinguiſhed only by the accent, which is on the firſt ſyllable of the noun, and on the laſt of the verb; as *ſèrment* and *ferment*, *rècord* and *recòrd*, &c. We are to obſerve alſo, that in order to a juſt expreſſion of words, ſome require only a ſingle accent on the long ſyllable; as in *tormènt*, &c. but in others it ſhould be marked double, as in *anˋˋmal*, becauſe it is pronounced as if the letter was wrote double, viz. *annimal*.

PRONUNCIATION is alſo uſed for the fifth and laſt part of rhetoric, which conſiſts in varying and regulating the voice agreeably to the matter and words, ſo as moſt effectually to perſuade and touch the hearers. It is much the ſame with what is otherwiſe called emphaſis. See the article EMPHASIS.

This emphaſis is a conſiderable ſtreſs or force of voice, laid upon that word in a ſentence, by which the ſenſe of the whole is regulated: thus, ſuppoſe you were aſked, *are you determined to walk this day to London?* If the emphaſis be placed on the word *you*, the anſwer may be, *yes, I go myſelf*; or *no, I ſhall ſend my ſon*. Again, if it be placed on the word *walk*, the anſwer is, *yes, I am*; or *no, I ſhall ride*: if on the words *to day*, then the anſwer is, *yes*; or *no, I ſhall go to morrow*: and, laſtly, if the emphaſis be placed on the word *London*, the anſwer may be, *no, I ſhall go to Richmond only*.

Quintilian adviſes his pupils to ſtudy the principles of pronunciation under a comedian. There are three things which come under the pronunciation, *viz.* the memory, voice, and geſture. See the articles MEMORY, *&c.*

PRONUNCIATION, in painting. See the article PRONOUNCING.

PROOF, in arithmetic, an operation whereby the truth and juſtneſs of a calculation is examined and aſcertained. The proper proof is always by the contrary rule: thus ſubſtraction is the proof of addition, and multiplication of diviſion; and *vice verſa*. See the articles ADDITION, SUBSTRACTION, *&c.*

PROOF, in law, *&c.* denotes the mediums or arguments uſed to evince the truth of any thing. In law proof is two-fold, *viz. viva voce*, by living witneſſes, and *probatio mortua*, a dead proof; ſuch is that of records, deeds, or other writings. Though ſome have been of opinion, that the law takes no notice of any other proof than that before a jury in a judicial way, and that which is on record; yet if it be agreed by the parties that the proof ſhall be made in ſuch a manner, or before a particular perſon, that form is to be obſerved, and ſhall prevail againſt what is uſually termed legal proof. In common agreements, *&c.* a perſon may bring his action, and therein aver that a certain thing was done, on which the defendant may take iſſue that the thing was not done, and then the plaintiff at the trial muſt make proof of the doing it. See the article EVIDENCE.

In the French law, the depoſition of one witneſs, or of a perſon deceaſed, makes what they call a ſemi-proof, or half proof; which in heinous caſes, frequently determines them to try the torture. See the article TORTURE.

PROOF is alſo uſed in a ſynonymous ſenſe with ſtandard: thus we call that proof-ſpirit, which is of the ſtandard ſtrength, or half alcohol half phlegm. See the articles SPIRIT, BRANDY, and DISTILLATION.

PROPAGATION, *propagatio*, the act of multiplying the kind, or of producing the like in the natural way of generation. See the article GENERATION.

PROPER, *proprium*, ſomething naturally and

and eſſentially belonging to any thing. The ſchoolmen diſtinguiſh four kinds of propers, or modes of propriety: the firſt called *proprium primo modo*, is what agrees to a ſingle ſpecies, but not to all the individuals; the ſecond, *proprium ſecundo modo*, is what agrees to the whole ſpecies, but agrees likewiſe to one another; the third, *proprium tertio modo*, is what agrees to a ſingle ſpecies, but not at all times; and the laſt and higheſt, *proprium quarto modo*, is that which alone agrees to one kind, to all the individuals thereof, and at all times.

PROPER, in reſpect of words, denotes their immediate and peculiar ſignification; or that directly and peculiarly attached to them; in which ſenſe, the word ſtands oppoſed to figurative.

PROPER, in grammar, is alſo applied to nouns, or names, which are diſtinguiſhed into proper and appellative. See the article APPELLATIVE.

Man is the appellative, John the proper name.

PROPER FRACTION. See FRACTION.

PROPER, in the civil juriſprudence, is uſed in oppoſition to acquired, for an inheritance derived by direct or collateral ſucceſſion.

PROPERTY, *proprietas*, in a general ſenſe, that which conſtitutes or denominates a thing proper; or it is a particular virtue or quality which nature has beſtowed on ſome things excluſive of all others: thus colour is a property of light; extenſion, figure, diviſibility, and impenetrability, are properties of body, *&c.* See the article LIGHT, *&c.*

PROPERTY, in law, is defined to be the higheſt right a perſon has, or can have, to any thing; it being uſed to denote that right which one has to lands or tenements, goods or chattels, in no reſpect depending upon another's curteſy. At this day property in lands, *&c.* is acquired either by entry, deſcent, law, or conveyance; and in goods and chattels property may be gained divers ways, though generally it is by deed of gift, or bargain and ſale.

There are held to be three manner of properties, 1. Abſolute property, which is where the proprietor has an abſolute power veſted in himſelf to diſpoſe of his eſtate as he pleaſes, ſubject to the laws of the land. 2. Qualified property, as in the caſe of huſband and wife, wherein the huſband has only a qualified property in the wife's lands, real chattels, *&c.* but in her perſonal chattels he has an abſolute property. 3. Poſſeſſory property, as when a perſon has goods delivered to him to keep, he has ſuch a property therein, that he may maintain actions againſt ſtrangers who take them out of his poſſeſſion. It is likewiſe the ſame when they are delivered to a carrier, or things are pawned. See the articles PAWN and BROKER.

Every owner of goods has undoubtedly a general property in them; but yet a legatee in a will hath no property in the goods bequeathed him, until ſuch time as they are delivered to him by the executor, ſo that he has the poſſeſſion. In the ſale of any thing, no property is veſted in the buyer till there is an actual delivery. If a perſon hires a horſe for ſo many days, he hath, during that time, a ſpecial property in the beaſt, and might have an action againſt even the maſter of it, did he diſturb him in his poſſeſſion. Where a perſon borrows or finds another man's goods, or in caſe one takes them from another, none of theſe acts will alter the property; though ſhould a perſon take corn from another, and convert it into malt, or turn timber into a houſe, *&c.* in theſe caſes the property becomes altered.

PROPHECY, προφητεια, a prediction made by divine inſpiration.

Mr. Whiſton condemns all allegorical explanation of the prophecies of the Old Teſtament cited in the New, as weak, enthuſiaſtic, *&c.* and adds, that if a double ſenſe of the prophecies be allowed, and there be no other method of ſhewing their completion than by applying them ſecondarily and typically to our Lord, after having been in their firſt and primary intention long ago fulfilled in the times of the Old Teſtament, we loſe all the real advantages of the antient prophecies as to the proof of chriſtianity. He therefore ſets up a new ſcheme in oppoſition thereto: he owns that taking the preſent text of the Old Teſtament for genuine, it is impoſſible to expound the apoſtles citations of the prophecies of the Old Teſtament on any other than the allegorical foundation; and therefore to ſolve the difficulty, he is forced to have recourſe to a ſuppoſition contrary to the ſenſe of all chriſtian writers before him, *viz.* that the text of the Old Teſtamen has been greatly corrupted ſince the apoſtolical age by the Jews.

Perſons pretending to prophecies, are

puniſhable at common law; by ſtatute, likewiſe, if any perſon publiſh ſuch prophecies with an intent to raiſe ſedition, they ſhall forfeit 10 l. for the firſt offence, and ſuffer a year's impriſonment; and for the ſecond, incur the forfeiture of all their goods, *&c.*

PROPHET, προφητης, in general, a perſon who foretels future events, but is particularly applied to ſuch inſpired perſons among the Jews as were commiſſioned by God to declare his will and purpoſes to that people. Among the canonical books of the Old Teſtament, we have the writings of ſixteen prophets, four of which are denominated the greater prophets, *viz.* Iſaiah, Jeremiah, Ezekiel, and Daniel, ſo called from the length or extent of their writings, which exceed thoſe of the others, *viz.* Hoſeah, Joel, Amos, Obadiah, Jonas, Micah, Nahum, Habakkuk, Haggai, Zachariah, and Malachi, who are called the leſſer prophets from the ſhortneſs of their writings. The Jews do not place Daniel among the prophets, becauſe, they ſay, he lived the life of a courtier rather than that of a prophet. An account of the ſeveral writings of the prophets may be ſeen each under its particular head. See the article ISAIAH, *&c.*

PROPHYLACTICE, προφυλακτικη, in medicine, that part thereof which inſtructs as to the method of preſerving health and averting diſeaſes.

PROPITIATION, in theology, a ſacrifice offered to God to aſſwage his wrath, and render him propitious. Among the Jews there were both ordinary and public ſacrifices, as holocauſts, *&c.* offered by way of thankſgiving; and extraordinary ones, offered by particular perſons guilty of any crime, by way of propitiation. The romiſh church believe the maſs to be a ſacrifice of propitiation for the living and the dead. The reformed churches allow of no propitiation but that one offered by Jeſus Chriſt on the croſs. Propitiation was alſo a feaſt among the Jews, celebrated on the tenth of the month Tiſri, in commemoration of the pardon proclaimed to their forefathers by Moſes on the part of God, who thereby remitted the puniſhment due to the crime of their worſhipping the golden calf.

PROPITIATORY, or MERCY-SEAT, among the Jews, was the cover or lid of the ark of the covenant. See ARK. The cherubims ſpread their wings over the propitiatory.

PROPLASM, is ſometimes uſed for a mould where any metal or ſoft matter, which will afterwards grow hard, is caſt: hence,

PROPLASTICE, the art of making moulds for caſting things in.

PROPOLIS, the name of a certain ſubſtance more glutinous and tenacious than wax, with which the bees ſtop up all the holes or cracks in the ſides of their hives. Beſides the wax and the honey which the bees gather in their daily travels, they have occaſion for this third ſubſtance at times, and that eſpecially when they are placed in a new hive. They not only ſtop in this manner all the cracks they can find, but even examine all the weak places of the hive, and will eat away a rotten part, to make up the deficiency with this propolis. It appears from the obſervations of Reaumur, that the propolis is a ſubſtance perfectly different from wax, and is a true genuine vegetable reſin, of a browniſh-red colour on the ſurface, and when broken, approaching to the colour of wax, carried home by the bees in lumps in the ſame manner in which they carry their wax. The apothecaries in ſome places keep this as a medicine in their ſhops. It readily diſſolves in ſpirit of wine, or oil of turpentine: this ſolution is of a fine gold-colour, and will ſerve as a varniſh to colour ſilvered picture-frames, or the like work.

PROPONTIS, or *ſea of* MARMORA, divides Europe from Aſia, having the Boſphorus on the north-eaſt, by which it has a communication with the Euxine ſea, and the Helleſpont on the ſouth-weſt, by which it communicates with the Archipelago. It is one hundred and twenty miles long, and in ſome places upwards of forty broad.

PROPORTION. When two quantities are compared one with another, in reſpect of their greatneſs or ſmalneſs, the compariſon is called ratio, reaſon, rate, or proportion: but when more than two quantities are compared, then the compariſon is more uſually called the proportion that they have to one another. The words ratio and proportion are frequently uſed promiſcuouſly.

When two quantities only are compared, the former term is called the antecedent, and the latter the conſequent.

The relation of two homogeneous quantities one to another, may be conſidered either, 1. By how much the one exceed

ceeds the other, which is called their difference. Thus 5 exceeds 3 by the difference 2. Or, 2. What part or parts one is of another, which is called ratio. Thus the ratio of 6 to 3 is $\frac{6}{3}=\frac{2}{1}$, or double; and the ratio of 3 to 6 is $\frac{3}{6}=\frac{1}{2}$, or ſubduple.

When two differences are equal, the terms that compoſe them are ſaid to be arithmetically proportional. Thus ſuppoſe the term to be a and b, their difference d. If a be the leaſt term, then $a+d=b$. And if a be the greateſt, then $a-d=b$.

But when two ratios are equal, the terms that compoſe them are ſaid to be geometrically proportional. For ſuppoſe a and b to be the terms of any ratio; if a be the leaſt term, put $r=\frac{b}{a}$, then $ar=b$ by equal multiplication: but if b be the leaſt term, put $r=\frac{a}{b}$, then $br=a$ by equal multiplication, and $\frac{a}{r}=b$ by equal diviſion.

Thus the ratio of two quantities, or of two numbers, in geometrical proportion, is found by dividing the antecedent by the conſequent, and the quotient is the exponent or denominator of the ratio.

Proportions, ſo many of them as are rational, or between number and number, have particular names given them by the greek and latin writers. Thus, if after the antecedent be divided by the conſequent, the quotient be 1, it is called proportion of equality, or ſimple proportion.

If the quotient be 2, 3, 4, (or any other integral number) it is called multiple proportion (*viz.* double, triple, quadruple, *&c.*) and the contrary to thoſe are called ſub-multiple, (*viz.* ſub-duple, ſub-triple, ſub-quadruple, *&c.*) or one half, one third, one fourth, or other ſuch aliquot part.

If the quotient be 1, with one ſuch part, as $1\frac{1}{2}$, $1\frac{1}{3}$, $1\frac{1}{4}$, *&c.* it is called ſuperparticular (*viz.* ſeſquialteral, ſeſquitertian, ſeſquiquartan, *&c.*) and the contraries hereunto are called ſub-ſuperparticular (*viz.* ſub-ſeſquialteral, ſub-ſeſquitertian, *&c.*)

If ſuch quotient be 2, 3, 4, (or ſuch other integer greater than unity) with ſuch an aliquot part it is called multiple-ſuperparticular (as $2\frac{1}{2}$ duple-ſeſquialteral, $3\frac{1}{3}$ triple-ſeſquitertian, $3\frac{1}{4}$ triple-ſeſquiquartan, *&c.*) and the contraries thereunto are ſub-multiple-ſuperparticular, as ſubduple-ſeſquialteral, ſubtriple-ſeſquitertian, *&c.*

If the quotient be 1, with ſome number of aliquot parts, as $1\frac{2}{3}$, $1\frac{3}{4}$, $1\frac{2}{5}$, *&c.* it is called ſuperpartient, (as ſuperbipartiens tertias, ſuper-tripartiens quartas, ſuperbipartiens quintas, *&c.*) and the contraries hereunto are ſub ſuperpartient, as ſub-ſuperbipartiens tertias, *&c.*

If ſuch quotient be ſome greater integer number, (as 2, 3, *&c.*) with ſuch number of aliquot parts, as $2\frac{2}{3}$, $3\frac{3}{4}$, $3\frac{2}{5}$, *&c.* it is called multiple-ſuperpartiens, (as dupla-ſuperbipartiens tertias, tripla-ſupertripartiens quartas, tripla-ſupertripartiens quintas, *&c.*) And the contraries thereunto, ſubmultiple-ſuperpartient, (as ſubdupla-ſuperbipartiens tertias, ſubtripla-ſupertripartiens quartas, *&c.*) as that of 31 to 7 (becauſe $\frac{31}{7}=4\frac{3}{7}$) is quadruple-ſupertripartiens ſeptimas; and its contrary, 7 to 31, is ſub-quadruple-ſupertripartiens ſeptimas. And under ſome of theſe compellations all proportions will fall, which are as one integer number to another.

But it is much better, and more intelligible, to expreſs theſe proportions, as the uſual manner now is, by the numbers themſelves, than by theſe names, as 31 to 7, or 7 to 31.

If when four quantities are conſidered, you find that the firſt hath as much greatneſs or ſmalneſs in reſpect to the ſecond, as the third hath in reſpect to the fourth: thoſe four quantities are called proportionals, and are thus expreſſed.

As $\left\{\begin{matrix} A:B::C:D \\ 8:2::16:4 \end{matrix}\right\}$ that is, as $A=8$ contains $B=2$ four times, ſo $C=16$ contains $D=4$ four times; and therefore A has the ſame ratio to B, as C has to D; and conſequently, theſe four quantities having equal ratios, are proportionals.

Proportion conſiſts of three terms at leaſt, whereof the ſecond ſupplies the place of two.

When three magnitudes, A, B, C, are proportional, the firſt A has a duplicate ratio to the third C, of that it hath to the ſecond B: but when four magnitudes, A, B, C, D, are proportional, the firſt A has a triplicate ratio to the fourth D, of what it has to the ſecond B; and ſo always in order one more, as the proportion ſhall be extended.

Duplicate ratio is thus expreſſed, $\frac{A}{C}=\frac{A}{B}$ twice; that is, the ratio of A to C is duplicate

plicate of the ratio of A to B. For let A=2, B=4, C=8; then the ratio of 2 to 8, is duplicate of the ratio of 2=A to B=4, or as the ſquare of 2 to the ſquare of 4.

Triplicate ratio is thus expreſſed, $\frac{A}{D} = \frac{A}{B}$ thrice; that is, the ratio of A again=2, to D=16, is triplicate of the ratio of A=2, to B=4, or as 8 the cube of 2, to 64 the cube of 4. Wherefore duplicate ratio is the proportion of ſquares, and triplicate that of cubes.

And the ratio of 2 to 8, is compounded of the ratio of that of 2 to 4, and of 4 to 8. From what has been ſaid of the nature of ratio and proportion, the ſix ways of arguing, which are often uſed by mathematicians, will evidently follow.

1. Alternate proportion is the comparing of antecedent to antecedent, and conſequent to conſequent. As if $\left\{\begin{matrix} A : B :: C : D \\ 2 : 4 :: 8 : 16 \end{matrix}\right\}$ therefore alternately, or by permutation, as $\left\{\begin{matrix} A : C :: B : D \\ 2 : 8 :: 4 : 16 \end{matrix}\right\}$.

2. Inverſe ratio, is when the conſequent is taken as the antecedent, and ſo compared to the antecedent as the conſequent. As A : B :: C : D; therefore inverſely as $\left\{\begin{matrix} B : A :: D : C \\ 4 : 2 :: 16 : 8 \end{matrix}\right\}$.

3. Compound ratio, is when the antecedent and conſequent, taken both as one, are compared to the conſequent itſelf. As A : B :: C : D; therefore by compoſition, as A + B : B :: C + D : D: in numbers, as 2 + 4 = 6, is to 4 :: ſo is 8 + 16 = 24, to 16.

4. Divided ratio, is when the exceſs wherein the antecedent exceedeth the conſequent, is compared to the conſequent. As A : B :: C : D; therefore by diviſion A — B : B :: C — D : D in numbers, as 16 : 8 :: 12 : 6; therefore 16—8=8, is to 8, ſo is 12—6=6 to 6.

5. Converſe ratio, is when the antecedent is compared to the exceſs wherein the antecedent exceeds the conſequent. As A : B :: C : D; therefore by converſe ratio, as A : A—B :: C : C—D: in numbers thus, as 16 : 16 — 8 = 8 :: 12 : 12 — 6 = 6,

6. Proportion of equality, is where there are taken more quantities than two in one order, and alſo as many quantities in another order, comparing two to two being in the ſame ratio: it follows, that as in the firſt order of quantities, the firſt is to the laſt, ſo in the ſecond order of quantities, is the firſt to the laſt: or otherwiſe it is compariſon of the extremes together, the mean quantities being omitted. Thus let A, B, C, be three quantities, and D, E, F, three others, and taking them two by two, let them be in the ſame proportion; that is, let A : B :: D : E, and B : C :: E : F; now if it be inferred that A, the firſt of the firſt order, is to C the laſt, as D the firſt of the ſecond order, is to F the laſt, this form of arguing is ſaid to be *ex æquo*, or from equality. In numbers, let 16 : 8 : 4 and 12 : 6 : 3 be in the ſame proportion when taken two by two; that is, as 16 : 8 :: 12 : 6, and as 8 : 4 :: 6 : 3; now if 16 in the firſt order be to 4 the laſt, as 12 the firſt of the ſecond order is to 3 the laſt, this is called proportion of equality.

7. Ordinate proportion, is when antecedent is to conſequent, as antecedent is to conſequent; and as the conſequent is to any other, ſo is the conſequent to any other: as when $\left\{\begin{matrix} A : B :: D : E \\ 12 : 3 :: 8 : 2 \end{matrix}\right\}$ alſo $\left\{\begin{matrix} B : C :: E : F \\ 3 : 9 :: 2 : 6 \end{matrix}\right\}$ and then it ſhall be $\left\{\begin{matrix} A : C :: D : F \\ 12 : 9 :: 8 : 6 \end{matrix}\right\}$.

8. Perturbate proportion, is when three magnitudes being put, and others alſo which are equal to theſe in multitude, as in the firſt magnitudes, the antecedent is to the conſequent, ſo in the ſecond magnitudes is the antecedent to the conſequent: and as in the firſt magnitudes the conſequent is to any other, ſo in the ſecond magnitudes is any other to the antecedent. Thus if $\left\{\begin{matrix} A, B, C \\ 16, 8, 4 \end{matrix}\right\}$ and $\left\{\begin{matrix} E, F, G \\ 12, 6, 3 \end{matrix}\right\}$ are two ſets of magnitudes, if $\left\{\begin{matrix} A : B :: F : G \\ 16 : 8 :: 6 : 3 \end{matrix}\right\}$ and $\left\{\begin{matrix} B : C :: E : F \\ 8 : 4 :: 12 : 6 \end{matrix}\right\}$ this is called perturbate proportion, and by the 23, 5 Eucl. it ſhall be as $\left\{\begin{matrix} A : C :: E : G \\ 16 : 4 :: 12 : 3 \end{matrix}\right\}$.

In the foregoing caſes, the product of the means is equal to that of the extremes, and therefore the quantities are proportionals.

When of ſeveral quantities the difference or quotient of the firſt and ſecond is the ſame with that of the ſecond and third, they are ſaid to be in a continued arithmetic or geometric proportion.

Thus $\left\{\begin{matrix} a, & a+d, & a+2d, & a+3d, & a+4d \\ a, & a-d, & a-2d, & a-3d, & a-4d \end{matrix}\right\}$ &c. is a ſeries of continued arithmetical proportionals,

portionals, whose common difference is d.

And $\left\{a, ar, arr, arrr, arrrr, ar^5\right\}$: $\left\{a, \frac{a}{r}, \frac{a}{rr}, \frac{a}{rrr}, \frac{a}{rrrr}, \frac{a}{r^5}\right\}$ &c. is a series of continued geometric proportionals, whose common multiplier is r or $\frac{1}{r}$, or whose ratio is that of 1 to r, or r to 1.

Note, that the sign $\div$, signifies continued proportion.

Again, when of several quantities the difference or quotient of the 1st and 2d is the same with that of the 3d and 4th (and not of the 2d and 3d) they are said to be in a discontinued arithmetic, or geometric proportion; such as

1 $\left\{\begin{matrix}a, a+d; e, e+d\\ a+d, a; e+d, e\end{matrix}\right\}$ for $\left\{\begin{matrix}a+d-a=e+d-e\\ 1=d.\end{matrix}\right.$

2 $\left\{\begin{matrix}a, ar; e, er;\\ ar, a; er, e;\end{matrix}\right\}$ for $\left\{\begin{matrix}\frac{a}{ar}=\frac{e}{er}=\frac{1}{r}\\ \frac{ar}{a}=\frac{er}{e}=\frac{r}{1}\end{matrix}\right\}$

Problem I. To two lines A and B, to find a third proportional D (plate CCXIII. fig. 4. n° 1.) make any right-lined angle, as CAB, then set off in AB, Ad=A, and on AC, ab=B. Set off also dB=B on AB; then join bd, and through B draw a line parallel to bd, so shall bC be the third proportional required, for A : B :: B : D by 2, 6, Eucl.

Prob. II. To three given lines A, B, and C, to find a fourth proportional D. Make any angle, CAE (*ibid.* n° 2.); then from A take Ab=A, and bC=B, and Ad=C; join bd, and through C draw CE parallel to bd; so shall dE be the line sought: for A : B :: C : D. 2, 6, Euclid.

PROPORTION *of figures.* Prob. I. To find the proportion that one rectangle hath to another, both length and breadth must be considered. For rectangles are to each other, as the products of their respective lengths multiplied by their breadths.

1, Thus, if there be two rectangles, the former of which hath its length five feet, and its breadth three; and the latter hath its length eight feet, and its breadth four. Then the rectangles will be to each other as 3×5 (=15), is to 4×8 (=32) that is, as 15 : 32, so that all the rectangles are to one another in a ratio compounded of that of their sides.

2. When rectangles have their sides proportionable, so that $\begin{matrix}AB\\ 8\end{matrix}$: : $\begin{matrix}EH\\ 4\end{matrix}$: : $\begin{matrix}AD\\ 4\end{matrix}$: $\frac{EF}{2}$, then is the rectangle A, (n° 3.) to the rectangle B, in a duplicate proportion to the ratio of the sides.

For the ratio of A to B, is compounded of the ratio of AB to EH, and of the ratio of AD to EF. And therefore the proportion of A to B, being compounded of equal ratios, must be duplicate of the ratio of their sides to each other; that is, duplicate of the ratio of AB : EH, or of AD : EF.

Hence all triangles, parallelograms, prisms, parallelopipeds, pyramids, cones, and cylinders, are to one another respectively compared, in a proportion compounded of that of their heights and bases.

3. All triangles, and parallelograms, pyramids, prisms, and parallelopipeds; also all cones, and cylinders, each kind compared among themselves; if they have equal altitudes, are in the same proportion as their bases; if they have equal bases, are as their heights.

For the bases, or heights, will severally be common efficients or multipliers; and therefore must make the products be in the same proportion as the multiplicand was before.

Thus, if the equal altitude of any two triangles, parallelopipeds, cones, &c. be called A, and their unequal bases B, and D: then it will be as B : D :: AB : AD.

This problem being of great use, ought to be placed among the elements of geometry.

Case I. To find two right-lines, whose sum or difference is given, reciprocally proportional to two given lines. Let the two given lines be B and C, and let the sum of the two lines sought be Z: it is required to find a point where Z may be so divided, as that B : A :: E : C. (no 4.)

First find m, a mean proportional between B and C, which erect perpendicularly at either end of Z, (n° 5.) draw D parallel to Z, describe a semicircle upon Z, and where D cuts that semi-circle, let fall m perpendicularly: then I say A and E are the lines required: for $AE=m^2=BC$. *Q. E. D.*

Case II. When the difference = X is given, (n° 6.) find m a mean proportional as before, which erect perpendicularly at either end of X: thus draw R from the middle point of X to M, and with that as radius describe a semi-

circle

circle on the center C: ſo ſhall A + X be the greater line, and E the leſſer ſought, for $A + X \times E = m^2 = BC$. *Q. E. D.*

Prob. II. Having two ſquares, to find two others reciprocally proportional, whoſe ſum is equal to a given ſquare.

Let the ſquares given be bb, cc, and the reciprocals required yy and $dd-yy$, then,

$$yy : bb :: cc : dd-yy$$
$$ddyy-y^4 = bbcc$$
$$y^4-ddyy+\tfrac{1}{4}d^4 = \tfrac{1}{4}d^4-bbcc$$
$$\tfrac{1}{2}d^2-y^2 = \sqrt{\tfrac{1}{4}d^4-bbcc}$$
$$y^2 = \tfrac{1}{2}d-\sqrt{\tfrac{1}{4}d^4-bbcc}$$
$$y = \sqrt{\tfrac{1}{2}d^2-\sqrt{\tfrac{1}{4}d^4-bbcc}}$$

The conſtruction of this is as follows. let AB (n° 7.) $= d$, and AC $= b$, and BD $= c$, find a fourth proportional, as $CE = \frac{bc}{d}$, and on CF $= \frac{1}{2}d$ deſcribe a ſemi-circle, and in it apply CG $=$ CE, then FG will be equal $\frac{\sqrt{\frac{1}{4}d^4-b^2c^2}}{d}$.

Let HC $= d$, and CI $= \frac{1}{2}d-\sqrt{\frac{1}{4}d^4-b^2c^2}$, the mean proportional will be CK $= y$, and on CH $= d$ deſcribe a ſemi-circle, and in it apply CL $=$ CK, then $LH = \sqrt{d^2-y^2}$, which is the ſide of the other ſquare ſought.

Prob. III. Having two ſquares, to find two other reciprocals whoſe difference ſhall be equal to a given ſquare.

Let the ſquares given be ff, gg, and the reciprocals ſought yy and $bb+yy$, then,

$$yy : ff :: gg : bb+yy$$
$$y^4+bbyy = ffgg$$
$$y^4+bbyy+\tfrac{1}{4}b^4 = ffgg+\tfrac{1}{4}b^4$$
$$y^2+\tfrac{1}{2}b^2 = \sqrt{ffgg+\tfrac{1}{4}b^4}$$
$$y^2 = \sqrt{ffgg+\tfrac{1}{4}b^4}-\tfrac{1}{2}b^2$$
$$y = \sqrt{\sqrt{ffgg+\tfrac{1}{4}b^4}-\tfrac{1}{2}b^2}.$$

The conſtruction of this is almoſt the ſame as in the preceding problem.

Of the proportion of ſolids, every parallelopiped, is to a pyramid of the ſame baſe and height, as 3 to 1, that is, the one is triple the other.

A cylinder, ſpheroid, and cone, of the ſame baſe and height, are as 3, 2, and 1.

Harmonic PROPORTION, is when three terms are ſo diſpoſed, that as the diff. of the firſt and ſecond : the diff. of the ſecond and third : : firſt : third; and they are ſaid to be harmonically proportional. Thus, 10, 15, 30, are harmonically proportional. For as the diff. of 10 and 15, is to the diff. of 15 and 30, ſo is 10 to 30. Alſo 12, 6, 4, are harmonically proportional; for $12-6 : 6-4 :: 12 : 4$. So $b^2+3bn+2n^2$, b^2+2bn, b^2+bn, are harmonically proportional. For $bn+2n^2 : bn :: b^2+3bn+2n^2 : b^2+bn$. Whence if the two firſt terms of an harmonic proportion be given, the third is readily found.

For if A, B, C, be harmonically proportional. Then $A-B : B-C :: A : C$, and $AC-BC = AB-AC$. Therefore $AB = 2A-B \times C$, and $BC = 2C-B \times A$. Conſequently $C = \frac{AB}{2A-B}$, and $A = \frac{BC}{2C-B}$. Again, when four terms are ſo diſpoſed, that as the diff. of the 1ſt and 2d : the diff. of the 3d and 4th : : 1ſt : 4th they are alſo harmonically proportional. As 10, 16, 24, 60; for as $10-16 : 24-60 :: 10 : 60$. Whence if the three firſt terms of ſuch an harmonic proportional be given, the 4th is eaſily found.

For if a, b, c, d, be harmonic proportionals, then $a-b : c-d :: a : d$; and $ad-bd = ac-ad$, therefore $d = \frac{ac}{2a-b}$, and $a = \frac{bd}{2d-c}$.

If the terms of an harmonic proportion be continued, then it is called an harmonic progreſſion. Thus, ſuppoſing b, to be the 2d term, d, the difference of the 1ſt and 2d and that the 1ſt exceeds the 2d. The progreſſion will be.

$$b+d,\ b,\ \frac{b^2+bd}{b+2d},\ \frac{b^2+bd}{b+3d},\ \frac{b^2+bd}{b+4d},\ \frac{b^2+bd}{b+5d},\ \&c.$$

Whence, if out of any rank of harmonic proportionals, there be taken any ſeries of equidiſtant terms, that ſeries will be harmonically proportional. And this kind of proportion has ſeveral other properties common with arithmetic and geometric proportions.

When three terms are ſo diſpoſed, that the diff. of the 1ſt and 2d : diff. of the 2d and 3d : : 3d : 1ſt, they are ſaid to be in a contra-harmonic proportion. Thus 6, 5, 3, and 12, 10, 4, are contra-harmonics. For $6-5 : 5-3 :: 3 : 6$; and $12-10 : 10-4 :: 4 : 12$. Or, ſuppoſing b greater than n, if the 2d term be greater than the 1ſt :

Fig 1. PROSTHAPHÆRESIS.

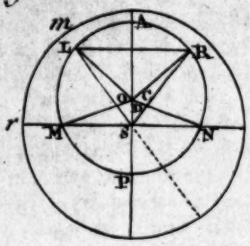


Fig. 2 PROJECTION.

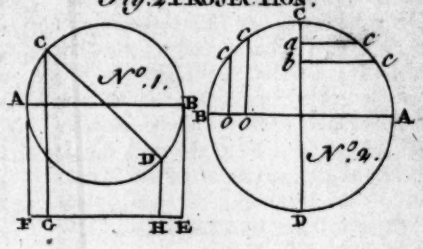
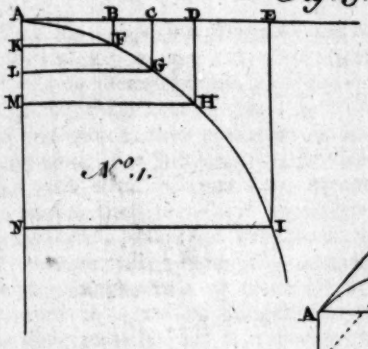
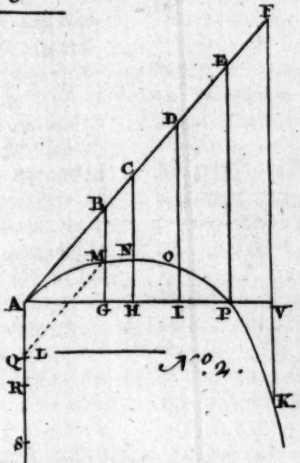


Fig. 3. PROJECTILES.





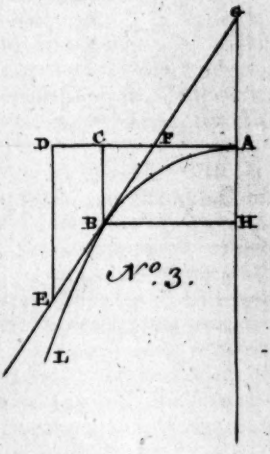
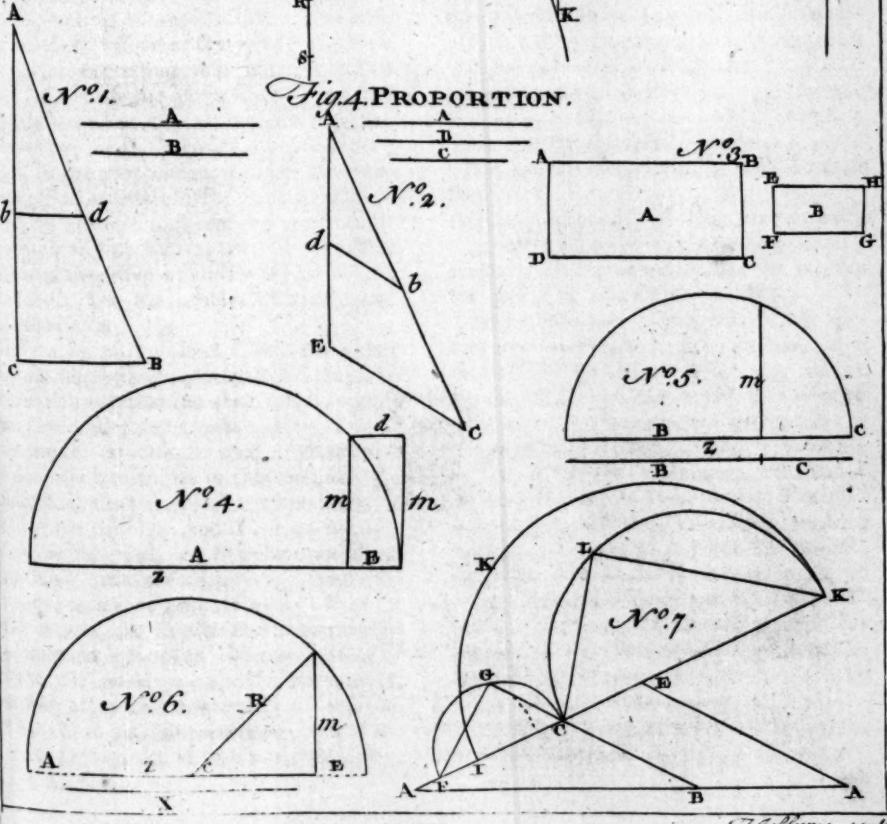


Fig. 4 PROPORTION.



T. Jefferys sculp.

BRITISH MUSEUM

Then $bn + n^2$, $b^2 + n^2$, $b^2 + bn$, are contra-harmonics, for $bn - b^2 : n^2 - bn :: b^2 + bn : bn + n^2$.

But if the 1st term exceeds the 2d, then, $b^2 + bn$, $b^2 + n^2$, $bn + n^2$, are contra-harmonics. For $bn^2 - n^2 : b^2 - bn :: bn + n^2 : b^2 + bn$.

PROPOSITION, *propositio*, in logic, part of an argument wherein ſome quality, either negative or poſitive, is attributed to a ſubject, or, according to Chauvinus, it is a complete conſiſtent ſentence, indicating or expreſſing ſomething either true or falſe, without ambiguity; as God is juſt.

While the comparing of our ideas is conſidered merely as the act of the mind, aſſembling them together, and joining or disjoining them according to the reſult of its perceptions, this operation is called judgment. See IDEA and JUDGMENT. But when theſe judgments are expreſſed in words, they then bear the name of propoſitions. Hence a propoſition is a ſentence expreſſing ſome judgment of the mind, whereby two or more ideas are affirmed to agree or diſagree: and as our judgments include at leaſt two ideas, one of which is affirmed or denied of the other; ſo a propoſition muſt have terms correſponding to theſe ideas. The idea of which we affirm or deny, and of courſe the term expreſſing that idea, is called the ſubject of the propoſition; and the idea affirmed or denied, as alſo the term anſwering to it, is called its predicate; thus in the propoſition, God is omnipotent, God is the ſubject, it being of him that we affirm omnipotence; and omnipotent is the predicate, becauſe we affirm the idea expreſſed by that word to belong to God. See the articles SUBJECT and PREDICATE.

But as in propoſitions ideas are either joined or disjoined, it is not enough to have terms expreſſing thoſe ideas, unleſs we have alſo ſome words to denote their agreement or diſagreement. Now that word which connects in this manner the ſubject and predicate of a propoſition, is called the copula; and if a negative particle be annexed, we thereby underſtand that the ideas are disjoined. The ſubſtantive verb is commonly made uſe of for the copula, as in the above-mentioned propoſition, "God is omnipotent;" where the word *is* expreſſes the copula, and ſignifies the agreement of the two ideas, God and omnipotence; but if we mean to ſeparate two ideas, then, beſides the ſubſtantive-verb, we muſt alſo uſe ſome particle of negation to expreſs this repugnance: the propoſition, "Man "is not perfect," may ſerve as an example of this kind; where the notion of perfection being removed from the idea of man, the negative particle *not*, is inſerted after the copula, to ſignify the diſagreement between the ſubject and predicate. The ſchoolmen call the two terms, *viz.* the ſubject and predicate, the matter; and the copula, the form of a propoſition.

When the mind joins two ideas, the propoſition expreſſing this judgment is termed affirmative; as, "a ſtone is "heavy;" and, on the contrary, when the mind ſeparates two or more ideas, the propoſition expreſſing this judgment is called negative; as, "God is not the "author of evil."

Now as terms may be either ſingular, or common and univerſal; if the ſubject of a propoſition be a common term taken in all its extent, the propoſition is called univerſal; as, "every man is mortal." If the common term be taken in an indeterminate part of its extent, the propoſition is called particular; as, "ſome "men are virtuous." If the ſubject of the propoſition be ſingular, the propoſition is called ſingular; as, "Ariſtotle "is the prince of philoſophers." Thoſe propoſitions which have only one ſubject and one attribute, are called ſimple; thoſe that have ſeveral ſubjects, or attributes, are called compound. See TERM, SUBJECT, PREDICATE, *&c.*

A ſyllogiſm conſiſts of three propoſitions, *viz.* the major, minor, and concluſion; an enthymeme, of two. See the articles SYLLOGISM and ENTHYMEME.

The ſchoolmen make ſeveral other ſpecies and diviſions of propoſitions, as a propoſition de primo adjacente, where the ſubject and predicate are both included under the verb, as *veni, vidi, vici*: a propoſition de ſecundo adjacente, is where either the ſubject or predicate is included in the verb; as, "Peter writes, I read;" a propoſition de tertio adjacente, is where both the ſubject and predicate are expreſs, and ſtand diſtinct from the verb, as "the mind is a ſubſtance." This propoſition is the rule or ſtandard of all the others, ſo that whatever propoſition can be reduced thereto is legitimate; and what cannot, is not legitimate.

Propoſitions are again divided into three claſſes; the firſt, regarding the matter;

the ſecond, the form; and the third, the thought: thoſe of the firſt claſs are ſubdivided into finite and infinite, direct and indirect, ſingle and manifold. Finite or definite propoſition, is that which declares ſomething determinate on a ſubject, as, "man is not a ſtone." Infinite or indefinite propoſition, is that where either one or both of the terms are infinite, or have a negative prefixed to them, as, *non-homo eſt albus, homo eſt non albus, non-homo eſt non-albus.* Direct propoſition is that wherein a higher or more general thing is predicated of a lower and more particular, as, "man "is an animal." Indirect propoſition, is that wherein an inferior is predicated of an higher, as "an animal is man." Single propoſition, is that either ſingly or by conjunction: it is ſingly ſuch when it affirms or denies one thing of one other thing, as "man is an animal:" by conjunction, when ſeveral propoſitions are joined and coupled together, thus, "the "ſun ſhines and it is day," are two propoſitions, which conjoined make this one, "if the ſun ſhines it is day."

Of ſuch conjunct propoſitions there are divers kinds, *viz.* hypothetical, diſjunctive, copulative, *&c.* Hypothetical propoſition, is that which conſiſts of ſeveral ſimple ones affected with ſome conditional one, as "if the ſun be ſet it is "night." For the diſjunctive, copulative, *&c.* ſee the articles DISJUNCTIVE, COPULATIVE, *&c.*

Compound propoſition, is that where one or both the terms excite ſeveral ideas in the mind, as "a man is body and ſoul, and both together." Manifold propoſition is that conſiſting of ſeveral ſubjects, as "Peter and Paul preached:" or of ſeveral predicates, as "Peter and "Paul preach and pray."

In reſpect of form, propoſitions are divided into affirmative and negative, true and falſe, pure and modal. Affirmative propoſition is that whoſe attribute is joined to the ſubject, "God is a ſpi-"rit." A negative propoſition is that whoſe attribute is ſeparated from the ſubject, as "man is not a ſtone." True propoſition is that which declares a thing to be what it really is; and a falſe propoſition is that which ſignifies a thing to be what it is not. The truth of a propoſition therefore depends on the connecting of the ſubject with the attribute, which is done by that act of the mind called judgment. Propoſitions are ſaid to be pure when they imply or involve nothing beſides their matter and form. Modal propoſition is that which, beſides the pure matter and form, involves ſome mode or manner of diſpoſition. See the article MODE.

To modal propoſitions the philoſophers refer excluſive, exceptive, and reſtrictive propoſitions. See the article EXCLUSIVE, *&c.*

For complex propoſitions, *&c.* ſee the article COMPLEX, *&c.*

PROPOSITION, in mathematics, is either ſome truth advanced and ſhewn to be ſuch by demonſtration, or ſome operation propoſed and its ſolution ſhewn. If the propoſition be deduced from ſeveral theoretical definitions compared together, it is called a theorem; if from a praxis, or ſeries of operations, it is called a problem. See the articles THEOREM and PROBLEM.

PROPOSITION, in poetry, the firſt part of a poem wherein the author propoſes briefly, and in general, what he is to ſay in the body of his work. It ſhould comprehend only the matter of the poem, that is the action and the perſons that act. Horace preſcribes modeſty and ſimplicity in the propoſition, and would not have the poet promiſe too much, nor raiſe in the reader too great ideas of what he is going to relate.

PROPREFECT, *propræfectus*, among the Romans, the prefect's lieutenant, or an officer whom the prefect of the pretorium commiſſioned to do any part of his duty in his place. See the article PREFECT.

PROPRETOR, a Roman magiſtrate, who having diſcharged the office of pretor at home, was ſent into a province to command there with his former pretorial authority. It was alſo an appellation given to thoſe who, without having been pretors at Rome, were ſent extraordinarily into the provinces to adminiſter juſtice with the authority of pretors.

PROPRIETATE, PROBANDA, in law, a writ directed to the ſheriff, to make enquiry into the property of goods diſtrained, when the defendant claims it in a replevin ſued; and if thereon it be found for the defendant, he can proceed no farther.

PROPRIETATIS ELIXIR, in pharmacy, an elixir, the preparation of which the London-diſpenſatory directs as follows: take of choice myrrh, of the beſt aloes and of ſaffron, each three ounces: when they are powdered, pour upon them

quart of rectified ſpirit of wine; digeſt them four days to an extraction of the tincture, which pour off: to the remainder pour on more ſpirit of wine; digeſt and pour off as before, and afterwards draw away ſome of the ſpirit by diſtillation: it is made acid by an addition of the ſpirit of ſulphur, any quantity at diſcretion. This may be given from ten to thirty drops to children, and to grown perſons from twenty to ſixty, or more. It is particularly good in pale wan complexions, and will itſelf frequently cure the green ſickneſs; but in hot, florid conſtitutions, it does not ſo well, eſpecially in thoſe ſubject to the gravel. It is accounted very good to deſtroy worms in children, if taken twice or thrice a day for two or three weeks together. See the article ELIXIR.

PROPRIETOR, or PROPRIETARY, he who has the property of any thing. See the article PROPERTY.

PROPRIETY, in grammar, is where the direct and immediate ſignification of a word agrees to the thing it is applied to; in which ſenſe, it is uſed in oppoſition to figurative, or remote ſignification.

PROQUESTOR, *proquæſtor*, the queſtor's lieutenant, or a perſon who diſcharged the office of queſtor in his ſtead. See the article QUESTOR.

PRO RATA, in commerce, a term ſometimes uſed by merchants for, in proportion; as each perſon muſt reap the profit or ſuſtain the loſs pro rata to his intereſt, that is, in proportion to his ſtock.

PRO RATA PORTIONIS, in law. See ONERANDA PRO RATA PORTIONIS.

PRORÆ OS, in anatomy, the ſame with os occipitis. See OCCIPITIS OS.

PROROGANDA ASSISA. See ASSISA.

PROROGATION, *prorogatio*, the act of prolonging, adjourning, or putting off to another time. The difference between a prorogation and an adjournment of parliament is, that by prorogation the ſeſſion is ended, and ſuch bills as paſſed in either houſe, or both houſes, and had not the royal aſſent, muſt, at the next aſſembly, begin again; becauſe that every ſeſſion of parliament is in law a ſeveral parliament: whereas, if the parliament be only adjourned, there is no new ſeſſion, and conſequently all things continue in the ſame ſtate they were in before the adjournment. See the articles ADJOURNMENT and PARLIAMENT.

PROSCRIPTION, *proſcriptio*, a publication made in the name of the chief or leader of a party, whereby he promiſes a reward to any one who ſhall bring him the head of one of his enemies.

PROSE, *proſa*, the natural language of mankind, looſe and unconfined, by poetical meaſures, rhymes, *&c.* in which ſenſe it ſtands oppoſed to verſe. See the article VERSE.

PROSECUTION. To make men liable to criminal proſecutions by the law of England, it is required, that they have the uſe of reaſon, and that they be *ſui juris*. On the firſt account, the law indulges infants under the age of diſcretion, idiots, and lunatics, whatever the nature of the fact may be; and even againſt the perſon of the king, as it has been held of late; neither will it ſuffer one who becomes *non compos* after he has committed a capital offence, to be either arraigned or executed. See the articles LUNATIC, INFANT, and IDIOT.

PROSECUTOR, in law, he that purſues a cauſe in another's name.

PROSELYTE, a new convert to ſome religion or religious ſect. See CONVERT.

PROSERPINACA, in botany, a genus of the triandria-trigynia claſs of plants, the calyx of which is a perianthium divided into three ſegments, and placed on the germen; the leaves are erect, acuminated and permanent; there is no corolla, nor pericarpium; the ſeed is ſingle, oſſeous, oval, and ſhut up in the cup.

PROSODY, *proſodia*, that part of grammar which treats of the quantities and accents of ſyllables, and the manner of making verſes. See GRAMMAR, QUANTITY, ACCENT, and VERSE.

The engliſh proſody turns chiefly on two things, numbers, and rhyme.

PROSONOMASIA, προσονομασια, a figure in rhetoric, whereby alluſion is made to the likeneſs of a ſound in ſeveral names or words.

PROSOPOPOEIA, Προσωποποιια, a figure in rhetoric, whereby we raiſe qualities, or things inanimate, into perſons. This figure is divided into two parts: 1. when good and bad qualities, accidents, and things inanimate, are introduced as living and rational beings; as in the following verſes of Milton:

-------Now gentle gales,
Fanning their odoriferous wings, diſpenſe

Native perfumes; and whiſper whence they ſtole
Thoſe balmy ſpoils.-------
The ſecond part of this figure is when we give a voice to inanimate things, and make rocks, woods, rivers, buildings, &c. expreſs the paſſions of rational creatures, as in the following lines of Spencer.
She foul blaſphemous ſpeeches forth did caſt,
And bitter curſes, horrible to tell,
That ev'n the temple wherein ſhe was plac'd,
Did quake to hear, and nigh aſunder burſt!

PROSTATÆ, in anatomy, a gland, generally ſuppoſed to be two ſeparate bodies, though in reality but one, of a roundiſh, or ſomewhat heart-faſhioned ſhape, ſituated juſt before the neck of the bladder, and ſurrounding the beginning of the urethra. The ſize of this body is about that of a walnut: it has two prominences, of a round figure in its hinder part, called prominentiæ natiformes: its eminence, called the caput gallinaginis, is in the urethra, and has two orifices, which are common to the veſiculæ ſeminales and the ejaculatory ducts; and frequently there is a little ſinus between theſe. The ſubſtance of the proſtatæ is glandulous and cavernous; it is very robuſt, and ſurrounded with a ſtrong membrane: the foraminula, or excretory ducts of this gland, diſcharge from the little cells within it, a thin white fluid. In the human body there are ten or twelve of them; in dogs they are more numerous. The veſſels of the proſtatæ are common with the vaſiculæ ſeminales.

The uſe of the proſtatæ is to ſecrete a fluid which, becauſe it is ejected in coition, ſome have imagined to be of uſe in generation: but according to Heiſter, it ſeems only deſtined to lubricate the urethra, and be a kind of vehicle to the ſemen, which is too thick otherwiſe to paſs with the neceſſary eaſe.

PROSTHAPHÆRESIS, προσθαφαιρεσις, in aſtronomy, the difference between the true and mean motion, or true and mean place, of a planet, called alſo equation of the orbit, or of the center, and ſimply equation.

Proſthaphæreſis amounts to the difference between the mean and equated anomaly. Suppoſe the circle ALMPNR (plate CCXIII. fig. 1.) the orbit of the earth ſurrounded by the ecliptic ♈ ♋, &c. and ſuppoſe S the ſun, and the earth in R, the mean anomaly will be the arch APR, or, caſting away the ſemicircle, the arch RP or the angle PCR; and the true anomaly, rejecting the ſemicircle, will be PSR, which is equal to PCR + CRS. If then to the mean anomaly we add the angle CRS, we ſhall have the true anomaly PSR, and the earth's place in the ecliptic. And here the angle CLS, or CRS, is called the proſthaphæreſis; by reaſon that it is ſometimes to be added and ſometimes ſubtracted from the mean motion, that we may have the true motion, or place of the earth.

PROSTHESIS, in grammar, the prefixing ſome letter or ſyllable at the beginning of a word, as in *gnatus*, for *natus*, &c.

PROSTHESIS, among ſurgeons, is the ſupplying that which is deficient by the appoſition of new matter, as the filing up ulcers, wounds, &c. with new fleſh.

PROSTYLE, in antient architecture, a range of columns in the front of a temple.

PROSYLLOGISM, in the ſchools, ſometimes denotes an argument produced to confirm one of the premiſſes of a ſyllogiſm. Others define it an argument compoſed of two ſyllogiſms, ſo diſpoſed that the concluſion of the former is the major or minor of the latter; ſo that the ſecond ſyllogiſm may be omitted or underſtood. See the article SYLLOGISM.

PROTASIS, in the antient drama, the firſt part of a comic or tragic piece wherein the ſeveral perſons are ſhewn their characters intimated, and the ſubject of the piece propoſed and entered upon. See the article DRAMA.

It might reach as far as our two firſt acts and where it ended the epitaſis commenced. See the article EPITASIS.

PROTATICUS, in the antient drama, a perſon who never appeared but in the protaſis, or firſt part of the play.

PROTEA, *narrow-leaved* SILVER-TREE, in botany, a genus of the tetrandria-monogynia claſs of plants, with a uniform compound flower, the peculiar corollæ of which are monopetalous, and divided into four ſegments at the limb: the ſeeds are contained in the cup, *viz.* a ſingle ſeed ſucceeding each peculiar corolla.

PROTECTION, the ſhelter, defence, authority, and aid employed by any one in behalf of another.

Protection, in law, in its general ſenſe

denotes the ſafety every ſubject, denizen, and alien enjoys from the laws; and in a more ſpecial ſenſe, it is uſed for an exemption or immunity given by the king to a perſon for a time, to ſecure him againſt ſuits at law, or other vexations.

Protection is alſo uſed for a privilege belonging to embaſſadors, members of parliament, &c. whereby they and their ſervants are ſecured from arreſts, &c.

PROTECTOR, a perſon who undertakes to ſhelter and defend the weak, helpleſs and diſtreſſed.

Every catholic nation and every religious order, has a protector reſiding at the court of Rome, who is a cardinal, and is called the cardinal protector.

Protector is alſo ſometimes uſed for a regent of a kingdom, made choice of to govern it during the minority of a prince.

Cromwell aſſumed the title and quality of lord protector of the commonwealth of England, &c.

PROTEST, in law, is a call of witneſs, or an open affirmation that a perſon does, either not at all, or but conditionally, yield his conſent to any act, or to the preceeding of any judge in a court in which his juriſdiction is doubtful; or to anſwer upon his oath farther than he is bound by law.

Any of the lords in parliament have a right to proteſt their diſſent to any bill paſſed by a majority: which proteſt is entered in form. This is ſaid to be a very antient privilege. The commons have no right to proteſt.

PROTEST, in commerce, is a ſummons wrote by a notary public to a merchant, banker, or the like, to accept or diſcharge a bill of exchange drawn on him, after his having refuſed either to accept or pay it.

There are two kinds of proteſts, the one for want of accepting the bill at the time of preſenting it; the other for want of payment when it becomes due, whether it has been accepted or not.

The bearers of bills of exchange that have been accepted, or which become payable at a certain day, are obliged to have them either payed or proteſted within three days after they become due, and this proteſt is to be notified, within fourteen days after to the party from whom the bill was received, who, upon ſuch proteſt being produced, is to repay the ſaid bill with intereſt and charges from the time of the proteſting; and in default of ſuch proteſt, or due notice within the days limited, the perſon ſo failing ſhall be liable to all coſts, damages, and intereſt.

PROTESTANT, a name firſt given in Germany to thoſe who adhered to the doctrine of Luther; becauſe in 1529, they proteſted againſt a decree of the emperor Charles V. and the diet of Spires; declaring that they appealed to a general council. The ſame name has alſo been given to thoſe of the ſentiments of Calvin, and is now become a common denomination for all thoſe of the reformed churches. See the articles LUTHERANS and CALVINISTS.

PROTESTATION, a ſolemn declaration made by ſome judiciary act or proceeding againſt any oppreſſion, violence or injuſtice; or againſt the legality of a ſentence, decree, or other procedure; importing that the party is determined to oppoſe it at the proper time. See the article PROTEST.

PROTHONOTARY, a term which properly ſignifies firſt notary, and which was antiently the title of the principal notaries of the emperors of Conſtantinople.

Prothonotary with us is uſed for an officer in the courts of king's bench and common pleas; the former of which courts has one, and the latter three. The prothonotary of the king's bench records all civil actions ſued in that court, as the clerk of the crown-office does all criminal cauſes. The prothonotaries of the common pleas enter and inrol all declarations, pleadings, aſſizes, judgments and actions: they alſo make out all judicial writs, except writs of habeas-corpus, and diſtringas jurator, for which there is a particular office; called the habeas corpora office; they likewiſe enter recognizances acknowledged, and all common recoveries; make exemplifications of records, &c.

In the court of Rome, there is a college of twelve prelates, called apoſtolical prothonotaries, empowered to receive the laſt wills of cardinals, to make all informations and proceedings neceſſary for the canonization of ſaints, and all ſuch acts as are of great conſequence to the papacy: for which purpoſe they have the right of admiſſion into all conſiſtories, whether public or half public. They alſo attend on the pope, whenever he performs any extraordinary ceremony out of Rome.

PROTHYRIS, in the antient architecture, is

is ſometimes uſed for a quoin or ſtone in the corner of a wall, and ſometimes for a croſs beam or rafter. Prothyris is alſo uſed by Vignola for a particular ſort of key of an arch, an inſtance of which is found in the ionic order: it conſiſts of a roll of water-leaves between two reglets and two fillets, crowned with a doric cymatium; its figure greatly reſembling that of modillion.

PROTHYRUM, in architecture, a porch at the outer door of a houſe.

PROTO, πρωτος, a greek term, frequently uſed in compoſition of priority: thus, proto-collum, in the antient juriſprudence, ſignifies the firſt leaf of a book; proto-martyr, the firſt martyr; proto-plaſt, the firſt man formed, &c.

PROTONOTARY, or PROTHONOTARY. See the article PROTHONOTARY.

PROTO-TYPE, is the original or model after which a thing was formed; but chiefly uſed for the patterns of things to be engraved, caſt, &c.

PROTOTYPHON, in grammar, ſometimes denotes a primitive word. See the article PRIMITIVE.

PROTRACTION, in ſurveying, the ſame with plotting. See the article PLOTTING and PROTRACTOR.

PROTRACTOR, in ſurgery, a kind of forceps, ſo called from extracting foreign bodies out of wounds. See WOUND, FORCEPS, and EXTRACTION.

PROTRACTOR is alſo the name of an inſtrument uſed for protracting or laying down on paper the angles of a field, or other figure. See PLOTTING.

The protractor is a ſmall ſemi-circle (plate CCXIV. fig. 1. n°. 1) of braſs, or other ſolid matter; the limb or circumference of which is nicely divided into 180 degrees: it ſerves not only to draw angles on paper, or any plane, but alſo to examine the extent of thoſe already laid down. For this laſt purpoſe, let the ſmall point, A, in the center of the protractor, be placed above the angular point, and let the ſide A B coincide with one of the ſides that contain the angle propoſed; then the number of degrees cut off by the other ſide, computing on the protractor from B, will ſhew the quantity of the angle that was to be meaſured.

But when any angle is to be made of a given quantity, ſuppoſe 40°, on a given line A B (*ibid.* n° 2.) and at a given point of that line A; upon this point apply the center A of the protractor, in ſuch a manner, that the ſide A B of the protractor may coincide with the given line A B; then let a dot or mark be made at the given number of degrees on the limb, *viz.* 40°, at C, and a right line drawn from C to A, will form an angle C A B = 40°, as is manifeſt.

This is the moſt natural and eaſy method either of examining the extent or quantity of an angle, or for deſcribing an angle of any quantity required. But when a protractor is wanting, the ſame may be done by means of a line of chords: thus to lay down the foreſaid angle C A B (*ibid.* n° 2.) by a line of chords, take 60° of the ſaid line in your compaſſes, and from the center A deſcribe an arch D E, which you imagine will be more than 40°; then taking the given number of degrees, *viz.* 40°, in your compaſſes, from the line of chords, and ſetting one foot in D, the point where A B produced interſects the arch D E, make a ſmall ſweep cutting the former arch in E; and, laſtly, join the points A and E either wholly or in part as far as C, and the angle E A B or C A B = 40°, as is manifeſt.

When an obtuſe angle is required to be laid down or meaſured, let its complement to a ſemi-circle be meaſured, and thence the obtuſe angle will be found, and may be laid down as directed above.

There is commonly annexed to this inſtrument, a fine needle fitted into a handle, and called a protracting-pin; the uſe of which is to prick off degrees and minutes from the limb of the protractor.

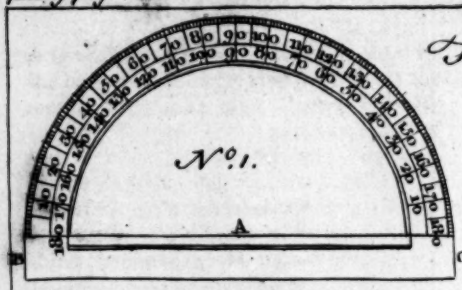
PROTUBERANCE, in anatomy, is any eminence whatever natural or preternatural, that projects or advances out beyond the reſt.

PROVEDITOR, an officer in ſeveral parts of Italy, particularly at Venice, who has the direction of matters relating to policy. At Venice there is alſo a proveditor general of the ſea, who pays the ſeamen and ſoldiers, and whoſe authority extends over the whole fleet when the captain-general is abſent. The captain-general and proveditor are mutual ſpies upon one another; for though the proveditor be inferior to the general, yet is the power ſo divided, that the one has authority without ſtrength, the other ſtrength without authority.

PROVENCE, a province or government of France, bounded by Dauphine on the north;

BRITISH MUSEUM

Fig. 1. PROTRACTOR.



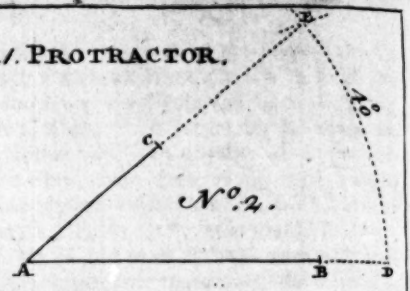


Fig. 2. the PTOLEMAIC SYSTEM of Aſtronomy

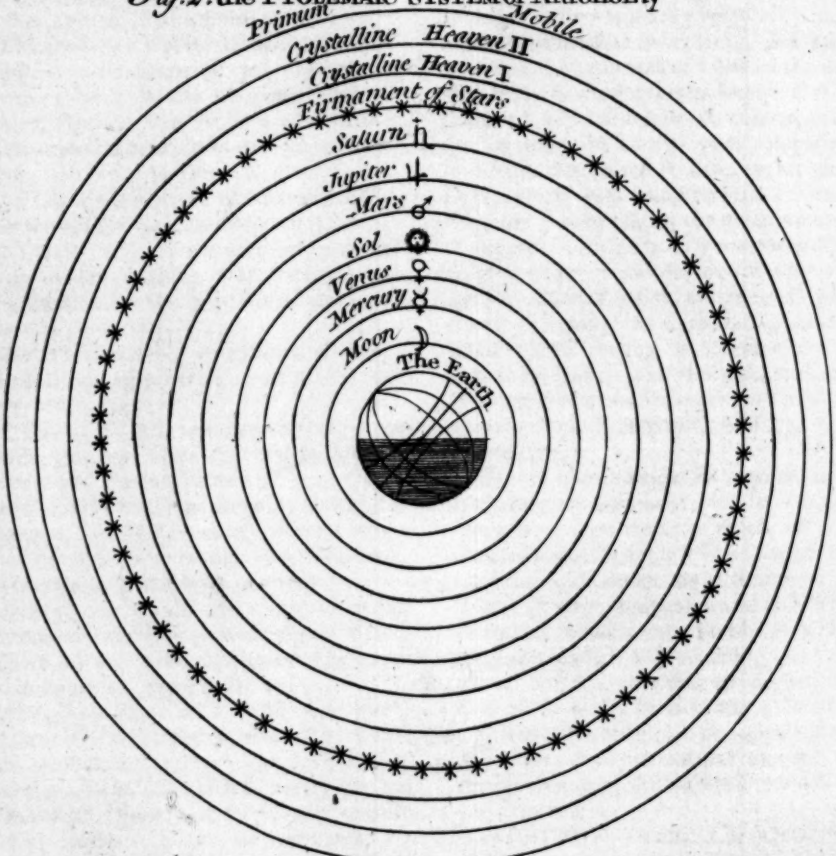
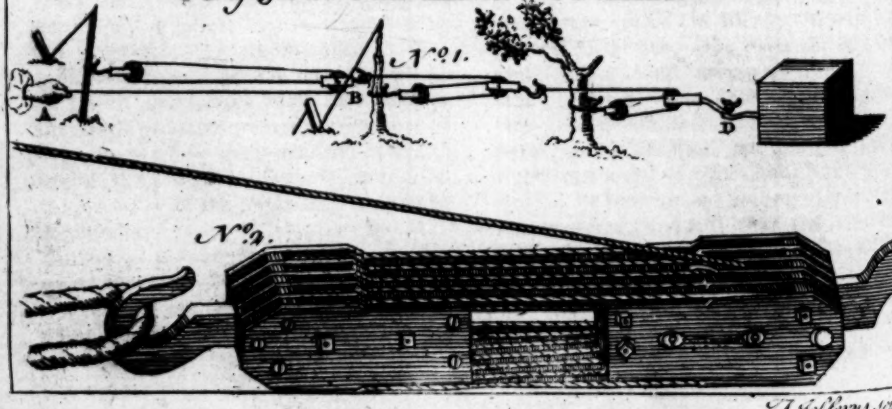


Fig. 3. Two Combinations of PULLIES.



D. Jeffreys ſculp.

north; by Piedmont on the eaſt; by the Mediterranean on the ſouth; and by the river Rhone, which ſeparates it from Languedoc, on the weſt: it is about an hundred miles long, and near as many broad.

PROVEND, or PROVENDER, originally ſignified a kind of veſſel containing the meaſure of corn daily given to a horſe, or other beaſt of labour for his ſubſiſtence: but it is now uſed for all the food given to cattle.

PROVER, in law, the ſame with probator. See the article PROBATOR.

PROVERB, according to Camden, is a conciſe, witty, and wiſe ſpeech, grounded upon experience, and for the moſt part containing ſome uſeful inſtruction.

Book of PROVERBS, a canonical book of the Old Teſtament, containing a part of the proverbs of Solomon, the ſon of David, king of Iſrael. The firſt twenty-four chapters are acknowledged to be the genuine work of that prince; the next five chapters are a collection of ſeveral of his proverbs, made by order of king Hezekiah; and the two laſt ſeem to have been added, though belonging to different and unknown authors, Agur the ſon of Jakeh, and king Lemuel.

In this excellent book are contained rules for the conduct of all conditions of life; for kings, courtiers, maſters, ſervants, fathers, mothers, children, *&c.*

PROVERBS *of Barthrouberri*, a ſacred book of the modern Indians. It is divided into three books, each containing ten chapters, and in each of theſe are ten ſentences or proverbs. The firſt book is entitled, *Of the way which leads to Heaven*; the ſecond, *Of the conduct of a rational creature*; and the third, *Of love.*

PROVIDENCE, the conduct and direction of the ſeveral parts of the univerſe, by a ſuperior intelligent being.

The notion of a providence is founded on this ſuppoſition, that the creator has not ſo fixed and aſcertained the laws of nature, nor ſo connected the chain of ſecond cauſes, as to leave the world to itſelf; but that he ſtill preſerves the reins in his own hands, and occaſionally interpoſes, alters, enforces, reſtrains, and ſuſpends thoſe laws by a particular interpoſition.

Some, with the epicureans, deny a providence, as imagining it inconſiſtent with the happineſs of the divine nature. See the article EPICUREAN PHILOSOPHY.

Others again deny the exiſtence of a providence, on account of the ſeemingly unjuſt diſtribution of good and evil. See the articles GOOD and EVIL.

Simplicius argues thus for a providence: If God do not look to the affairs of the world, it is either becauſe he cannot or will not; but the firſt is abſurd, ſince to govern cannot be difficult, when to create was eaſy; and the latter is both abſurd and blaſphemous. See the article GOD.

The ſentiments of Cicero are likewiſe very preciſe and pertinent to this purpoſe: he thinks it impoſſible for one who duely conſiders the innumerable objects of the univerſe, and their invariable order and beauty, to entertain the leaſt doubt, but that there is ſome efficient cauſe who preſides over and directs the mighty fabric! Nay he lays it down as a fundamental principle of all ſocieties, that there is a divine providence, which directs all events, obſerves the actions of mankind, whether good or bad, diſcerns the very intention of the heart, and will certainly make a difference between good men and the wicked.

Nuns of PROVIDENCE, a community of young women at Paris, who make two vows, *viz.* of chaſtity and obedience. They are habited in black, and board young ladies who chuſe to be educated among them.

PROVIDENCE-PLANTATION, a colony of New-England, which, with Rhode-iſland, conſtitutes a charter-government: its chief town is Newport.

PROVIDENCE is alſo one of the Bahama-iſlands, planted and fortified by the Engliſh: weſt long. 78°, north lat. 25°.

PROVINCE, *provincia*, in roman antiquity, a country of conſiderable extent, which, upon being entirely reduced under the roman dominion, was new-modelled according to the pleaſure of the conquerors, and ſubjected to the command of annual governors ſent from Rome; being commonly obliged to pay ſuch taxes and contributions as the ſenate thought fit to demand.

Theſe provinces got the appellations of conſular or pretorian, according as they were governed by conſuls or pretors. See the articles CONSUL and PRETOR.

PROVINCE, in geography, a diviſion of a kingdom or ſtate, compriſing ſeveral cities, towns, *&c.* all under the ſame government, and uſually diſtinguiſhed by the extent either of the civil or eccleſiaſtical juriſdiction.

The

The church diſtinguiſhes its provinces by archbiſhoprics; in which ſenſe, England is divided into two provinces, Canterbury and York. See the articles CANTERBURY and YORK.

The united provinces, are the ſeven northern provinces of the low countries, who, revolting from the ſpaniſh dominion, made a perpetual alliance, offenſive and defenſive, at Utrecht, anno 1579. See the article NETHERLANDS.

PROVINCIAL, *provincialis*, ſomething relating to a province. See the preceding article.

It alſo denotes, in romiſh countries, a perſon who has the direction of the ſeveral convents of a province.

PROVINE, a branch of a vine laid in the ground to take root and propagate. See the article VINE.

PROVINS, a city of Champaign, in France, forty-five miles ſouth-eaſt of Paris.

PROVISION, in the canon law, denotes the title or inſtrument, by virtue whereof an incumbent holds a benefice, biſhopric, *&c.*

Proviſions by prevention, called alſo *gratiæ expectativæ & mandata de providendo*; ſee the article PREMUNIRE.

PROVISO, in law, a condition inſerted in a deed, upon the obſervance whereof the validity of the deed depends.

Proviſo, in judicial matters, is where the plaintiff deſiſts from proſecuting an action, by bringing it to trial in due time; in which caſe, the defendant may take out a venire facias to the ſheriff in theſe words, Proviſo quod, *&c.* to the end that, if the plaintiff take out any writ to that purpoſe, the ſheriff ſhall ſummon but one jury upon them both. In which caſe it is called going to trial by proviſo.

PROVISOR, in general, denotes one who hath the care of providing things neceſſary, being the ſame with purveyor.

PROVISOR, in our ſtatutes, alſo denotes a perſon who ſued to the court of Rome for a proviſion or expectative grace. See the article PREMUNIRE.

PROVOCATIVE, in phyſic, a medicine which is ſuppoſed to ſtrengthen nature, and incites to venery.

PROVOST, *præpoſitus*, an officer, whereof there are divers kinds, civil, military, *&c.*

PROVOST of a city or town, is the chief municipal magiſtrate in ſeveral trading cities, particularly Edinburgh, Paris, *&c.* being much the ſame with mayor in other places.

He preſides in city courts, and, together, with the baillies, who are his deputies, determines in all differences that ariſe among citizens.

The provoſt of Edinburgh, as well as all the other conſiderable towns in Scotland, has the title of lord; and the former calls yearly conventions of the royal boroughs to Edinburgh by his miſſives.

PROVOST, or PREVOT ROYAL, a ſort of inferior judge eſtabliſhed throughout France, to take cognizance of all civil, perſonal, real, and mixed cauſes, among the people only.

Grand PROVOST *of France*, or of the houſhold, has juriſdiction in the king's houſe, and over the officers therein; looks to the policy thereof, the regulation of proviſions, *&c.*

Grand PROVOST *of the conſtable*, a judge who manages proceſſes againſt the ſoldiers in the army who have committed any crime.

He has four lieutenants diſtributed throughout the army, called provoſts of the army, and, particularly, provoſts in the ſeveral regiments.

PROVOST *marſhal of an army*, is an officer appointed to ſeize and ſecure deſerters, and all other criminals. He is to hinder ſoldiers from pillaging, to indict offenders, and ſee the ſentence paſſed on them executed. He alſo regulates the weights and meaſures, and the price of proviſions, *&c.* in the army. For the diſcharge of his office, he has a lieutenant, a clerk, and a troop of marſhal-men on horſeback, as alſo an executioner.

There is alſo a provoſt marſhal in the navy, who hath charge over priſoners, *&c.*

The French have a provoſt-general of the marines, who is to proſecute the marines, when guilty of any crime, and make report thereof to the council of war; beſides a marine provoſt in every veſſel, who is a kind of gaoler, and takes the priſoners into his care, and keeps the veſſel clean.

PROVOSTS *of the marſhals*, are a kind of lieutenants of the marſhals of France; of theſe are an hundred and eighty ſeats in France; their chief juriſdiction regards highwaymen, footpads, houſe-breakers, *&c.* See MARSHAL.

PROVOST *of the mint*, a particular judge inſtituted for the apprehending and proſecuting of falſe coiners.

PROVOST, or PREVOT, in the king's ſtables; his office is to attend at court, and hold the king's ſtirrup, when he mounts his horſe, &c. There are four provoſts of this kind, each of whom attends in his turn, monthly.

PROW, *prora*, in navigation, denotes the head or fore-part of a ſhip, particularly in a galley, being that which is oppoſite to the poop or ſtern. See SHIP.

In the middle of the prow is the beak that cuts the water, on the top of which is commonly ſome figure or hieroglyphic.

The prow is lower than the poop, and contains fewer decks.

PROXENETA, or PROXENETES, a kind of broker or agent, who tranſacts between two perſons.

It is chiefly applied to thoſe who negotiate marriages, &c.

The proxenetæ made a kind of college in Rome; and to them the fathers addreſſed themſelves to ſound the inclinations of the young men they intended for their daughters.

PROXIMITY, *proximitas*, denotes the relation of nearneſs, either in reſpect of place, blood, or alliance.

PROXY, *procurator*, a perſon who officiates as a deputy in the room of another.

Princes are uſually married by proxies, or repreſentatives; and every peer of Great Britain has the privilege of conſtituting a proxy, to vote for him in his abſence: yet ſuch a one muſt be entered in perſon, and ſometimes theſe proxies have been refuſed by the king.

The term proxy or procuracy, among civilians, alſo denotes a commiſſion given to a proctor by a client, impowering him to manage a cauſe in his ſtead. See the article PROCTOR.

And among canoniſts, proxies ſignify annual payments otherwiſe called procurations. See PROCURATION.

PRUCH, or BRUGG, a town of Auſtria, in Germany, twenty-two miles ſouth-eaſt of Vienna.

PRUCK, or BRUCH, of Stiria, in Germany, ſixty miles ſouth weſt of Vienna.

PRUINA, HOAR-FROST, in phyſiology. See the article FROST.

PRUNELLÆ, in pharmacy, a preparation of purified ſaltpetre, called alſo cryſtal mineral, made in this manner: having melted any quantity of ſaltpetre, caſt a little flowers of ſulphur upon it, and when that is burnt throw on more; and continue to do ſo, till the nitre flow as clear as rock-water. Then with a clean iron or braſs-ladle take it out, and putting it into moulds till coagulated, preſerve it for uſe.

It is ſaid to be diuretic and cooling, and therefore often given in fevers: it is alſo very good in gonorrhœas, ſore throats, and inflammations of the tonſils; being gently melted in the mouth, and ſwallowed with a little fine ſugar.

Its doſe is from ſix grains to a dram.

PRUNES, in commerce, are plums dried in the ſunſhine, or in an oven. See the the article PLUM.

Prunes of Brunolia pay for each pound, on importation, a duty of $2\frac{32\frac{1}{2}}{100}$ d. and draw back, on exportation, $2\frac{1}{100}$ d.

PRUNIFEROUS TREES, thoſe with pretty large and fleſhy fruit, with a nucleus in the middle, and called by botaniſts a drupe. See the article DRUPE.

PRUNING, in gardening and agriculture is the lopping off the ſuperfluous branches of trees, in order to make them bear better fruit, grow higher, or appear more regular.

Pruning, tho' an operation of very general uſe, is nevertheleſs rightly underſtood by few; nor is it to be learned by rote, but requires a ſtrict obſervation of the different manners of growth of the ſeveral ſorts of fruit-trees; the proper method of doing which cannot be known without carefully obſerving how each kind is naturally diſpoſed to produce its fruit: for ſome do this on the ſame year's wood, as vines; others, for the moſt part, upon the former year's wood, as peaches, nectarines, &c. and others upon ſpurs which are produced upon wood of three, four, &c. to fifteen or twenty years old, as pears, plums, cherries, &c. therefore, in order to the right management of fruit trees, proviſion ſhould always be made to have a ſufficient quantity of bearing wood in every part of the trees, and at the ſame time there ſhould not be a ſuperfluity of uſeleſs branches, which would exhauſt the ſtrength of the trees, and cauſe them to decay in a few years.

The reaſons for pruning of fruit-trees; are, 1. To preſerve them longer in a vigorous bearing-ſtate; 2. To render them more beautiful; and, 3. To cauſe the fruit to be larger and better taſted.

The general inſtructions for pruning are as follows: the greateſt care ought to be taken of fruit trees in the ſpring, when they

they are in vigorous growth; which is the only proper ſeaſon for procuring a quantity of good wood in the different parts of the tree, and for diſplacing all uſeleſs branches as ſoon as they are produced, in order that the vigour of the tree may be entirely diſtributed to ſuch branches only as are deſigned to remain. For this reaſon trees ought not to be neglected in April and May, when their ſhoots are produced: however, thoſe branches which are intended for bearing the ſucceeding year ſhould not be ſhortened during the time of their growth, becauſe this would cauſe them to produce two lateral ſhoots from the eyes below the place where they were ſtopped, which would draw much of the ſtrength from the buds of the firſt ſhoot: and if theſe two lateral ſhoots are not entirely cut away at the winter-pruning, they will prove injurious to the tree. This is to be chiefly underſtood of ſtone-fruit and grapes; but pears and apples, being much harder, ſuffer not ſo much, tho' it is a great diſadvantage to thoſe alſo to be thus managed. It muſt likewiſe be remarked, that peaches, nectarines, apricots, cherries and plums are always in the greateſt vigour when they are leaſt maimed by the knife, for where large branches are taken off they are ſubject to gum and decay; it is therefore the moſt prudent method to rub off all uſeleſs buds when they are firſt produced, and to pinch others, where new ſhoots are wanted to ſupply the vacancies of the wall; by which management they may be ſo ordered as to want but little of the knife in winter-pruning. The management of pears and apples is much the ſame with theſe trees in ſummer; but in winter they muſt be very differently pruned: for as peaches and nectarines, for the moſt part, produce their fruit upon the former year's wood, and muſt therefore have their branches ſhortened according to their ſtrength, in order to produce new ſhoots for the ſucceeding year; ſo, on the contrary, pears, apples, plumbs, and cherries, producing their fruit upon ſpurs, which come out of the wood of five, ſix, and ſeven years old, ſhould not be ſhortened, becauſe thereby thoſe buds which were naturally diſpoſed to form the ſpurs, would produce wood-branches; by which means the trees would be filled with wood, but would never produce much fruit. The branches of ſtandard-trees ſhould never be ſhortened unleſs where they are very luxuriant, and by growing irregularly on one ſide of the trees, attract the greateſt part of the ſap, by which means the other parts are either unfurniſhed with branches, or are rendered very weak; in which caſe the branch ſhould be ſhortened down as low as is neceſſary, in order to obtain more branches to fill up the hollow of the tree: but this is only to be underſtood of pears and apples, which will produce ſhoots from wood of three, four, or more years old; whereas moſt ſorts of ſtone-fruit will gum and decay after ſuch amputations: whenever this happens to ſtone-fruit, it ſhould be remedied by ſtopping or pinching thoſe ſhoots in the ſpring, before they have obtained too much vigour, which will cauſe them to puſh out ſide branches; but this muſt be done with caution. You muſt alſo cut out all dead or decaying branches, which cauſe their heads to look ragged, and alſo attract noxious particles from the air: in doing of this, you ſhould cut them cloſe down to the place where they were produced, otherwiſe that part of the branch which is left will alſo decay, and prove equally hurtful to the reſt of the tree; for it ſeldom happens when a branch begins to decay, that it does not die quite down to the place where it was produced, and if permitted to remain long uncut, often infects ſome of the other parts of the tree. If the branches cut off are large, it will be very proper, after having ſmoothed the cut part exactly even with a knife, chiſſel, or hatchet, to put on a plaſter of grafting clay, which will prevent the wet from ſoaking into the tree at the wounded part. All ſuch branches as run a-croſs each other, and occaſion a confuſion in the head of the tree, ſhould be cut off; and as there are frequently young vigorous ſhoots on old trees, which riſe from the old branches near the trunk, and grow upright into the head, theſe ſhould be carefully cut out every year, leſt, by being permitted to grow, they fill the tree too full of wood. For pruning the roots and branches of trees in tranſplanting them, ſee the article PLANTING.

As to the pruning of foreſt-trees, if they be large, it is beſt not to prune them at all; yet, if there be an abſolute neceſſity, avoid taking off large boughs as much as poſſible. And, 1. If the bough be ſmall, cut it ſmooth, cloſe, and ſloping. 2. If the branch be large, and the tree old, cut it

it off at three or four feet from the ſtem. 3. If the tree grow crooked, cut it off at the crook ſloping upward, and nurſe up one of the moſt promiſing ſhoots for a new ſtem. 4. If the tree grow top-heavy, its head muſt be lightened, and that by thinning the boughs that grow out of the main branches. But if you would have them ſpring, rub off the buds, and ſhroud up the ſide-ſhoots. 5. If the ſide-bough ſtill break out, and the top be able to ſuſtain itſelf, give the boughs that put forth in ſpring a pruning after Midſummer, cutting them cloſe.

PRUNUS, the PLUM-TREE, in botany. See the article PLUM-TREE.

PRURITUS, or PRURIGO, among phyſicians, denotes an itching ſenſation. See the article ITCH.

PRUSSIA, a province of Poland, ſituated on the coaſt of the Baltic ſea, and divided into regal and ducal Pruſſia, the firſt ſubject to Poland, and the laſt to the king of Pruſſia.

PRUSSIAN BLUE, among painters, &c. an animal-colour, prepared thus: take of crude tartar and nitre, each four ounces; pulverize and mix them together, and by decrepitation, bring them to a fixed ſalt; which being powdered hot, add to it four ounces of thoroughly dried ox-blood, reduced to a fine powder: calcine the mixture in a cloſe crucible, whereof it may fill two thirds: then lightly grind the matter in a mortar, and throw it hot into two quarts of boiling water; boil them together for half an hour, and afterwards, ſtraining off the liquor, waſh the remaining black ſubſtance with freſh water, and ſtrain as before, continuing to do this till the water poured off becomes inſipid: put the ſeveral liquors together, and evaporate them to two quarts. Next, diſſolve an ounce of green vitriol, firſt calcined to whiteneſs, in ſix ounces of rain-water, and filtre the ſolution: diſſolve alſo half a pound of crude alum in two quarts of boiling water; and add this to the ſolution of vitriol, taken hot from the fire, pouring to them likewiſe the firſt lixivium, whilſt thoroughly hot, in a large veſſel; a great ebullition and a green colour will immediately enſue; whilſt this ebullition continues, pour the mixture out of one veſſel into another, and afterwards let it reſt; then ſtrain the liquor through a linen cloth, and let the matter or pigment remain in the ſtrainer, from whence put it, with a wooden ſpatula, into a ſmall new pot; pour upon it two or three ounces of ſpirit of ſalt, and a beautiful blue colour will immediately appear. Let the matter be now well ſtirred, then ſuffered to reſt for a night; afterwards thoroughly edulcorate it by repeated affuſions of rain-water, allowing a proper time for the precipitate to ſubſide; and being drained in a linen-ſtrainer, and gently dried, it at laſt becomes the pigment called pruſſian blue, of an exquiſite colour. See the articles COLOUR, PAINTING, BLUE, &c.

PRYTANEUM, πρυτανειον, in grecian antiquity, a large building in Athens, where the council of the prytanes aſſembled, and where thoſe, who had rendered any ſignal ſervice to the commonwealth, were maintained at the public expence. See the next article.

PRYTANES, πρυτανεις, in grecian antiquity, were the preſidents of the ſenate, whoſe authority conſiſted chiefly in aſſembling the ſenate; which, for the moſt part, was done once every day.

The ſenate conſiſted of five hundred, fifty ſenators being elected out of each tribe; after which, lots were caſt, to determine in what order the ſenators of each tribe ſhould preſide, which they did by turns, and during their preſidentſhip were called prytanes. However, all the fifty prytanes of the tribes did not govern all at once, but ten at a time, *viz.* for ſeven days; and after thirty five days, another tribe came into play, and preſided for other five weeks; and ſo of the reſt.

PSADURIA, a claſs of coarſer ſtones, of a laxer texture, not laminated, but ſplitting with equal eaſe in all directions. Of this claſs there are two genera, 1. Pſaduria, conſiſting of pure cryſtal and ſpar, without any admixture of heterogeneous particles, and containing ſeven different ſpecies. 2. Impure pſaduria, conſiſting of ſparry, cryſtalline, and talcy particles, and containing ſix different ſpecies.

PSALM, ψαλμος, a divine ſong or hymn; but chiefly appropriated to the hundred and fifty Pſalms of David, a canonical book of the Old Teſtament.

Moſt of the Pſalms have a particular title, ſignifying either the name of the author, the perſon who was to ſet it to muſic or ſing it, the inſtrument that was to be uſed, or the ſubject and occaſion of it. Some have imagined, that David was the ſole author of the Book of Pſalms; but the titles of many of them prove the contrary, as Pſalm xix. which appears

to have been written by Moſes. Many of the Pſalms are inſcribed with the names Korah, Jeduthun, &c. from the perſons who were to ſing them. Pſalm lxxii. and cxxvii. are under the name of Solomon; the former being compoſed by David for the uſe of his ſon, and the latter being probably compoſed by Solomon himſelf. The authority and canonicalneſs of the Book of pſalms has always been acknowledged, both by jews and chriſtians. However, nothing can be a greater argument of its obſcurity than the great number of commentaries upon them.

Sternhold, one of the grooms of the privy-chamber to kind Edward VI. ſet about a tranſlation of the Pſalms into engliſh metre; but he only went through thirty-ſeven of them, the reſt being ſoon after done by Hopkins and others. This tranſlation was at firſt diſcountenanced by many of the clergy, who looked upon it as done in oppoſition to the practice of chanting the Pſalms in cathedrals: and indeed, ſays Broughton, the uſe of theſe ſinging Pſalms is rather connived at than allowed; ſince no one could ever diſcover any authority for it, either from the crown or convocation.

PSALMODY, ψαλμωδία, the art or act of ſinging pſalms. See the preceding article.

Pſalmody was always eſteemed a conſiderable part of devotion, and uſually performed in the ſtanding poſture; and as to the manner of pronunciation, the plain ſong was ſometimes uſed, being a gentle inflection of the voice, not much different from reading, like the chant in our catherals: at other times more artificial compoſitions were uſed, like our anthems.

As to the perſons concerned in ſinging, ſometimes a ſingle perſon ſung alone; ſometimes the whole aſſembly joined together, which was the moſt antient and general practice. At other times the pſalms were ſung alternately, the congregation dividing themſelves into two parts, and ſinging verſe about, in their turns. There was alſo a fourth way of ſinging, pretty common in the IVth century, which was, when a ſingle perſon began the verſe, and the people joined with him in the cloſe: this was often uſed for variety, in the ſame ſervice with alternate pſalmody.

The uſe of muſical inſtruments, in the ſinging of pſalms, ſeems to be as antient as pſalmody itſelf; the firſt pſalm we read of, being ſung to the timbrel, viz. that of Moſes and Miriam, after the deliverance of the Iſraelites from Egypt; and afterwards, muſical inſtruments were in conſtant uſe in the temple of Jeruſalem. When the uſe of organs was introduced into the chriſtian church, is not certainly known; but we find about the year 660, that Conſtantine Copronymus, emperor of Conſtantinople, ſent a preſent of an organ to Pepin king of France.

PSALTER, ψαλτηριον, the ſame with the Book of Pſalms. See the article PSALM.

Among the religious, in the popiſh countries, the term pſalter is alſo given to a large chapelet or roſary, conſiſting of an hundred and fifty beads, according to the number of pſalms in the pſalter.

PSALTERY, ψαλτηριον, a muſical inſtrument, much in uſe among the antient Hebrews, who called it nebel.

We know little or nothing of the preciſe form of the antient pſaltery. That now in uſe is a flat inſtrument, in form of a trapezium, or triangle truncated at top; it is ſtrung with thirteen wire-chords, ſet to uniſon or octave, and mounted on two bridges, on the two ſides: it is ſtruck with a plectrum, or little iron-rod, and ſometimes with a crooked ſtick. Its cheſt or body reſembles that of a ſpinet.

PSEUDO, from ψευδω, a greek term uſed in the compoſition of many words, to denote falſe, or ſpurious; as the pſeudo-acacia, or baſtard-acacia; pſeudo-fumaria, or baſtard-fumitory; pſeudo-ruta, or baſtard-rue, &c. See the articles ROBINIA, FUMITORY, and RUE.

We alſo ſay a pſeudo-apoſtle, or falſe apoſtle; a pſeudo-prophet, or falſe prophet, &c. See the articles APOSTLE, PROPHET, &c.

PSEUDO-DIPTERE, in antient architecture. See the article DIPTERE.

PSEUDONYMUS, ψευδωνυμος, among critics, an author who publiſhes a book under a falſe or feigned name, as cryptonymus is given to him who publiſhes one under a diſguiſed name, and anonymous to him who publiſhes without any name at all.

PSEUDO-STELLA, any kind of meteor newly appearing in the heavens, and reſembling a ſtar.

PSIDIUM, in botany, a genus of the icoſandria-monogynia claſs of plants, the flower whereof conſiſts of five oval, concave, and patent petals; and its fruit

a very large unilocular berry, containing a great number of very ſmall ſeeds.

PSILOTHRON, in medicine, the ſame with depilatory. See DEPILATORY.

PSITTACUS, the PARROT, in ornithology. See the article PARROT.

PSOAS, in anatomy, the name of two muſcles, diſtinguiſhed by the epithets magnus and parvus. The pſoas magnus is one of the flexor-muſcles of the thigh, and ariſes from the firſt, ſecond, third, and fourth vertebræ of the loins. The pſoas parvus is one of the flexor-muſcles of the loins, which ariſes by a ſlender tendon from the os pubis, where it is joined to the ilium; and is inſerted into the ſide of the upper vertebra of the loins; it is often wanting, and when found, its office is to aſſiſt the quadratus in elevating the oſſa innominata, eſpecially when we lie down.

PSORA, ψωρα, in medicine, the ſame with the itch. See the article ITCH.

PSORALIA, the ITCH TREE, in botany, a genus of the diadelphia-decandria claſs of plants, with a papilionaceous flower; and the fruit is a pod, of the length of the cup, and contains only one kidney-ſhaped ſeed.

PSOROPHTHALMIA, ψωροφθαλμια, a ſcurfy eruption of the eye-brows, attended with an itching of the part.

PSYCHOLOGY, ψυχολογια, that branch of anthropology which treats of the ſoul, its faculties, paſſions, &c. See SOUL, FACULTY, PASSIONS, &c.

PSYCHOMANCY, ψυχομαντια, a kind of divination, performed by raiſing the ſouls of perſons deceaſed. See the article DIVINATION.

PSYCHROMETER, an inſtrument for meaſuring the degrees of coldneſs or heat in the air, and more uſually called thermometer. See THERMOMETER.

PSYLLIUM, FLEA-WORT, in botany, is comprehended by Linnæus among the plantains. See pl. CCVIII. fig. 4. and the article PLANTAIN.

The ſeeds of pſyllium are recommended in the dyſentery, and corroſion of the inteſtines. See the article DYSENTERY.

PTARMICA, in pharmacy, medicines proper to excite ſneezing, and otherwiſe called ſternutatories. See the article STERNUTATORY.

PTARMICA, SNEEZE-WORT, in botany, a genus of the ſyngeneſia-polygamia-ſuperflua claſs of plants, the compound flower whereof is radiated, and the peculiar hermaphrodite ones of a funnel-ſhape, with a patulous quinquifid limb; the ſtamina are five capillary very ſhort filaments; and the ſeeds, one of which ſucceeds each hermaphrodite flower, are contained in the cup. See plate CCVIII. fig. 5.

The leaves of this plant are ſometimes uſed in ſallad; and when dried, and reduced to powder, they make a good ſternutatory.

PTELEA, in botany, a genus of the tetrandria-monogynia claſs of plants, the flower whereof conſiſts of four lanceolated, plane, patent petals; and its fruit is a circular membrane, placed perpendicularly with a cavity in the middle, containing a ſingle ſeed.

PTERARIA, in the hiſtory of inſects, a name given to that ſeries of inſects, which have wings. See INSECT.

Of the inſects of this ſeries, ſome have only two wings, others have four; they are hence naturally arranged into the two orders of the diptera and the tetraptera. See DIPTERA and TETRAPTERA.

PTERIS, in botany, a genus of the cryptogamia-filicum claſs of plants, in which the fructifications are diſpoſed in form of a line, ſurrounding the edges of the lower ſide of the leaves.

This genus comprehends the female fern and the rough ſpleenwort.

PTEROPHORI, πτεροφοροι, in roman antiquity, the meſſengers, or couriers, who brought tidings of a declaration of war, or the like; ſo called from their carrying wings on the points of their pikes.

PTERYGIUM, in ſurgery, the ſame with pannus or unguis. See UNGUIS.

PTERYGOIDE, ſomething reſembling a wing; from a reſemblance to which, four apophyſes or proceſſes of the os ſphenoides have been called pterygoide. See the article SPHENOIDES.

PTERYGOIDÆUS, in anatomy, the name of two muſcles of the lower jaw, one internal and the other external. The internal pterygoidæus-muſcle has its origin in the cavity of the pterygoide proceſs, and its termination is in the interior and lower ſuperficies of the angle of the jaw. The external pterygoidæus ariſes from the exterior lamina of the ſame proceſs, and terminates a little above the inſertion of the other.

There are alſo ſeveral pairs of muſcles of the pharynx and uvula, as the pterygo-pharyngæus, and pterygo-ſtaphylinus, which have got their names from being connected by the ſame proceſs. The pterygo-ſtaphylinus ariſes from the upper part

part of the ſaid proceſs, and deſcending between its two lamellæ, turns back its tendon over the thin apophyſis of the interior lamella, as over a pulley, to the anterior part of the membrane of the palate, into which it is inſerted, and ſerves to draw the uvula downwards and forwards.

PTISAN, πτισανη, is properly barley decorticated, or deprived of its hulls, by beating in a mortar, as was the antient practice: though the cooling potion, obtained by boiling ſuch barley in water, and afterwards ſweetening the liquor with liquoriee-root, is what at preſent goes by the name of ptiſan; and to render it laxative, ſome add a little ſena, or other herbs of the ſame intention.

PTOLEMAIC, or PTOLEMÆAN *ſyſtem of aſtronomy*, is that invented by Claudius Ptolemæus, a celebrated aſtronomer and mathematician of Peluſium, in Egypt, who lived in the beginning of the IId century of the chriſtian æra.

This hypotheſes ſuppoſes the earth immoveably fixed in the center, not of the world only, but alſo of the univerſe: and that the ſun, the moon, the planets, and ſtars all move about it, from eaſt to weſt, once in twenty-four hours, in the order following, *viz.* the moon next to the earth, then mercury, venus, the ſun, mars, jupiter, ſaturn, the fixed ſtars, the firſt and ſecond cryſtalline heavens, and above all the fiction of their primum mobile. See plate CCXIV. fig. 2. See alſo MOON, *&c.*

This ſyſtem or hypotheſis was firſt invented, and adhered to, chiefly becauſe it ſeemed to correſpond with the ſenſible appearances of the celeſtial motions. They took it for granted, that the motions which thoſe bodies appeared to have, were ſuch as they truly and really performed: and not dreaming of any motion in the earth, nor being apprized of the diſtinction of abſolute and relative or apparent motion, they could not make a proper judgment of ſuch matters; but were under a neceſſity of being miſled by their ſenſes, for want of the aſſiſtances we now enjoy.

It is eaſy to obſerve, they had no notion of any other ſyſtem but our own, nor of any other world but the earth on which we live. They imagined that all the fixed ſtars were contained in one concave ſphere, and that the primum mobile was circumſcribed by the empyreal heaven, of a cubic form, which they ſuppoſed to be heaven, or the bliſsful abode of departed ſouls.

It would ſcarce have been worth while to have ſaid ſo much about ſo abſurd an hypotheſis, as this is now well known to be, were it not that there are ſtill numerous retainers thereto, who endeavour very zealouſly to defend the ſame, and that for two reaſons principally, *viz.* becauſe the earth is apparently fixed in the center of the world, and the ſun and ſtars ſeem to move about it daily; and alſo becauſe the ſcripture aſſerts the ſtability of the earth, the motion of the ſun, *&c.* But that the diurnal motion of the earth occaſions all theſe appearances, we have abundantly proved under the articles DIURNAL and COPERNICAN.

And as to the argument drawn from ſcripture, as it was never intended for an inſtitution of aſtronomy and philoſophy, ſo nothing in it is to be underſtood as ſtrictly or poſitively aſſerted in relation thereto; but only as ſpoken agreeably to the common phraſe, or vulgar notion of things: and thus Sir Iſaac Newton himſelf would always ſay, the ſun riſes, ſets, *&c.* though he well knew it was juſt the reverſe in fact; ſince there are divers phænomena of the heavenly bodies altogether inconſiſtent with, and, in ſome things, exactly contradictory to ſuch an hypotheſis, as has been ſhewn by the arguments adduced to prove the truth of the copernican ſyſtem. See COPERNICAN.

PTYALISM, πτυαλισμος, in medicine, a ſalivation, or frequent and copious diſcharge of ſaliva. See SALIVATION.

PUBERTY, *pubertas*, among civilians, *&c.* the age wherein a perſon is capable of procreation, or begetting children.

Boys arrive at puberty at fourteen years of age, and girls at twelve: eighteen years of age is accounted full puberty.

The natural ſtate of mankind, after puberty, ſays M. Buffon, is that of marriage, wherein they may make uſe of the new faculties they have obtained, by arriving at puberty; a ſtate which will become painful, and may even ſometimes be fatal, if celibacy be obſtinately perſiſted in. The too long continuance of the ſeminal liquor in the veſſels, formed to contain it, may produce diſorders in either ſex, or at leaſt irritations ſo violent, that the united force of reaſon and religion will ſcarcely be ſufficient to enable him to reſiſt thoſe impetuous paſſions, which render man like the beaſts, who are furious and head-ſtrong, when they

they feel the force of these impressions. The extreme effect of this irritation in women is what physicians call the furor uterinus; but the mere force of nature alone seldom produces those fatal passions that spring from this disorder. See the article FUROR UTERINUS.

An opposite constitution of body is infinitely more common amongst women; the greatest part of them are naturally cold, or more or less tranquil under this passion: there are also men who continue chaste without the least difficulty; and he observes, that he has known some, who have enjoyed a good state of health, and have arrived to a considerable age, without being prompted by nature to gratify this passion in any manner whatsoever.

PUBES, among anatomists, &c. denotes the middle part of the hypogastric region of the abdomen, lying between the two inguina or groins. See ABDOMEN.

In adults, the pubes is more or less protuberant, and covered with hair; the appearance of which is the first sign of puberty. See the preceding article.

The pubes is that part of the abdomen which surrounds, in a great measure, the parts of generation. See the article GENERATION.

The os pubis is one of the three ossa innominata. See INNOMINATA.

The foramen of this bone is remarkable, as being the largest of all the foramina of the bones; it makes room for the passage of two muscles of the thigh, and the crural arteries and veins. In women, the os pubis is much smaller, and placed at a greater distance from the other bones than in men; and the angle between it and the ischium, is also larger in proportion in females: a circumstance very favourable not only to the gestation of the fœtus, but likewise to its exclusion. See the articles FOETUS and DELIVERY.

PUBLICAN, *publicanus*, among the Romans, one who farmed the taxes and public revenues.

PUBLICATION, *publicatio*, the act of making a thing known to the world; the same with promulgation.

By the canons, publication is to be made of the banns of matrimony, three times before the ceremony can be solemnized, without special licence to the contrary.

PUCELLAGE, *pucellagium*, or *puellagium*, denotes the state of virginity. See the article VIRGINITY.

PUCERON, *podura*, in zoology, a genus of wingless insects, with fewer than six pair of legs. The body is short and roundish; the tail is crooked and forked; the legs are three pairs, and serve only for walking; and the eyes are two, but each composed of eight lesser ones.

The pucerons are extremely numerous, living on the young branches of trees and plants; and often found in such clusters, as wholly to cover them: they are usually denominated from the trees and places where they are found; there being scarce a vegetable, either in the fields or gardens, that has not a peculiar species of puceron to feed on its juices.

PUDENDA, the parts of generation in both sexes. See GENERATION.

PUERILITY, in discourse, is defined by Longinus, to be a thought, which, by being too far-fetched, becomes flat and insipid. Puerility, he adds, is the common fault of those who affect to say nothing but what is brilliant and extraordinary.

PUGIL, *pugillus*, in physic, &c. such a quantity of flowers, seeds, or the like, as may be taken up between the thumb and two fore-fingers.

It is esteemed to be the eighth part of the manipule or handful.

PUISNE, or PUNY, in law, one younger born. It is not only applied to the second, third, fourth, &c. child, with regard to the first-born; but to the third, with regard to the second, &c. The last of all is called cadet.

It is also applied to a judge, or counsellor, who is in some respect inferior to another.

PULEX, the FLEA, in zoology. See the article FLEA.

PULLEY, *trochlea*, in mechanics, one of the mechanical powers, called by seamen a tackle. See TACKLE and POWER.

When a little wheel, commonly called a sheave, or sheever, is so fixed in a box or block, as to be moveable round a center-pin, passing thro' it, such an instrument is called a pulley. See plate CCXV. n° 3. And sometimes, though improperly, a box or block with several sheevers in it, is also called a pulley, as that represented *ibid*, n° 2. The first of these is, by workmen, called a snatch-block.

A rope going round one or more pullies, in order to raise a weight, is called the running-rope; and when a block and its sheevers is so fixed, that whilst it remains im-

immoveable, another block and ſheevers riſes, with the weight hanging at it, ſuch a machine is called a pair of blocks.

If ADBE (*ibid.* n° 1.) be a pulley, upon which hang the weights P, W; then; ſince the neareſt diſtances of the ſtrings AP, and BW, from the center of motion C, are AC and BC, the pulley will be reduced to the lever or ballance, AB, with reſpect to its power; and from thence it appears, that ſince AC = BC, we ſhall always have P = W, for an equilibrum; and, therefore, no advantage in raiſing a weight, *&c.* can be had from a ſingle pulley. In a combination of two pullies, AB, and DFEG (*ibid.* n° 4.) the power is doubled; for the pulley DFEG is reducible to the lever ED, which muſt be conſidered as fixed in the point E, to the immovable ſtring HE; and the power acting at D, is equal to P; and the weight W, is ſuſtained from the center C, of the pulley; but P : W :: CE : DE; therefore, ſince DE = 2CE, it is W = 2P, or P = ½ W.

From what has been ſaid, we may deduce the following rule, to know the advantage to be gained by a pair of blocks, let their number of pulleys and ſheevers be what they will, *viz.* as 1 is to the number of ropes, or of the parts of the rope, applied to the lower pulleys, ſo is the weight to the power. Thus, it is evident, that in n° 1. one pound ſuſtains only a weight of one pound; in n° 4. 1 pound ſuſtains a weight of 2 pounds; in n° 5. a weight of 5 pounds; and in n° 6, 7, and 8. 1 pound raiſes 4 and 6 pounds. However, it ought to be obſerved, that the above rule is only applicable where the lower pulleys riſe altogether in one block, along with the weight; for when they act upon one another, and the weight is only faſtened to the lowermoſt, the force of the power is doubled by each pulley: thus, in n° 10. a power equal to 1 pound, will ſuſtain 16 pounds, by means of four pulleys; becauſe 1×2×2×2×2 = 16. Again, in the combination of pulleys, repreſented in plate CCXIV. fig. 3. n° 1. if the power at A be 1, that at B is 3, and at D 27. And with the combination, *ibid.* n° 2. which conſiſts of 20 ſheevers, five on each pin, one man may raiſe a ton weight.

The force of the pulley may alſo be eaſily ſhewn by comparing the velocities of the power and weight; for it is evident, if the weight W (*ib.* n° 4.) be raiſed one inch, each ſtring HE, DB, will be ſhortened one inch, and conſequently the ſtring AP will be lengthened two inches; and ſo P will paſs through twice the ſpace that W does, in the ſame time: conſequently the tackle of pulley, in the form of n° 5. will increaſe the power five times; and that of fig. 7. and 8. will increaſe it ſix times.

In the diſpoſition of pulley according to n° 10. it is plain, ſince each pulley has a fixed rope, it muſt be conſidered as a lever of the ſecond ſort, and ſo will double the power of the foreging pulley; and ſo four pulleys will increaſe the power ſixteen times.

Though the laſt-mentioned form be of the greateſt force from the ſame number of pulleys; yet, if we conſider the ſimplicity, force, and conveniency of the tackle of pulley altogether, none is ſuperior to that of the form of n° 9. where the uppermoſt pulley is fixed, and each has a rope annexed to the weight; its power is therefore thus eſtimated: when the weight W, is raiſed one inch the rope AB will be lengthened as much; and ſo the pulley C will deſcend one inch, by which means the rope CD will be lengthened two inches, and one by the riſing of the weight W; wherefore the pulley E, will deſcend three inches; and thus the rope EP, will be lengthened ſix inches by that means (*viz.* three on each ſide) alſo, the riſing of the weight will cauſe it to lengthen one inch more, ſo that the power P, goes through ſeven inches, while the weight W, riſes one: therefore, P : W :: 1 : 7. And thus you proceed for any other number.

PULMO, the LUNGS, in anatomy. See the article LUNGS.

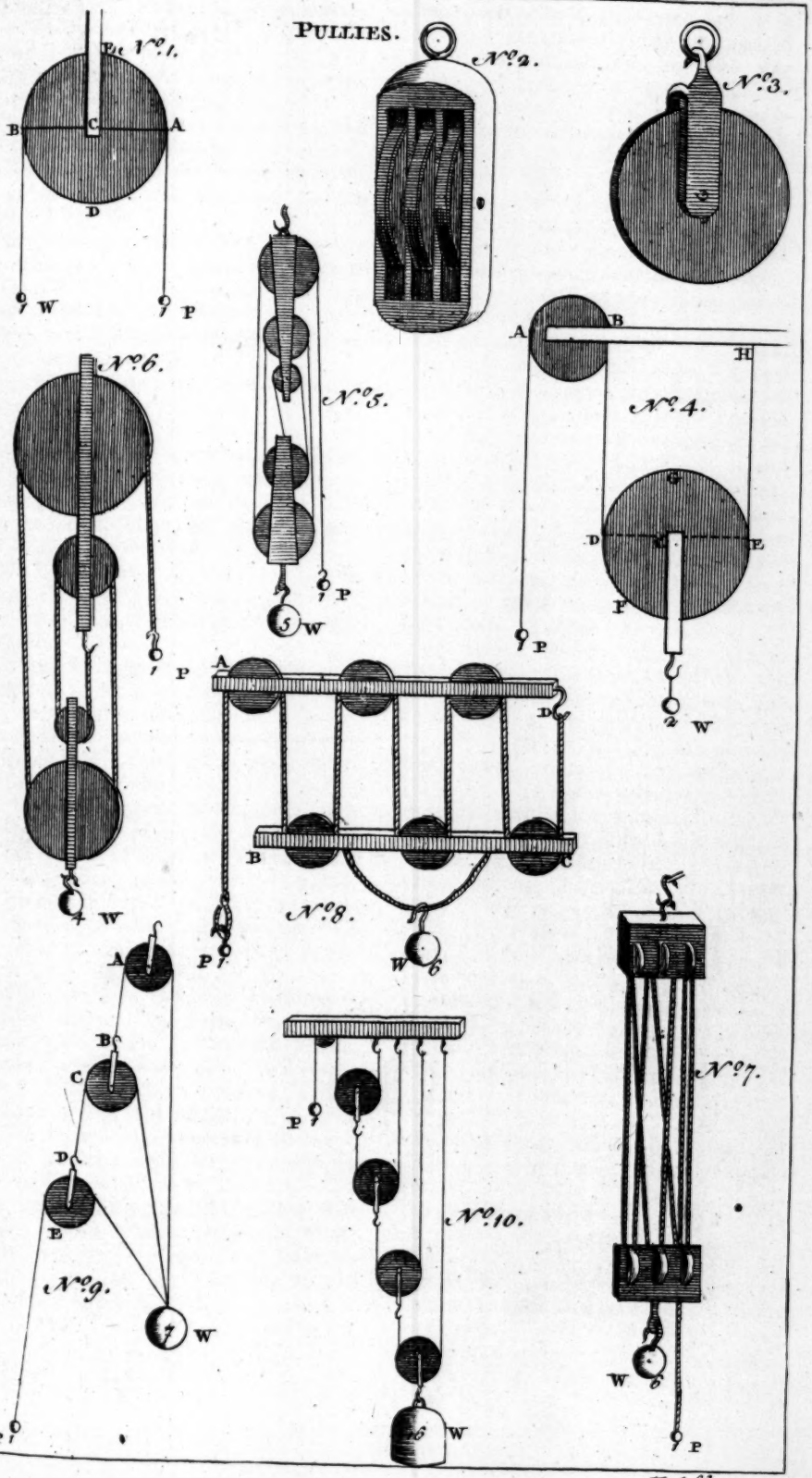
PULMO MARINUS, or SEA-LUNGS, a name given by ſome naturaliſts to a ſpecies of meduſa, which ſeems a mere lump of whitiſh ſemi-pellucid jelly. See the article MEDUSA.

It is found in great abundance, floating on the ſurface of the water, about Sheppey-iſland, in Kent.

PULMONARIA, SAGE OF JERUSALEM, in botany, a genus of the pentandria-monogynia claſs of plants, with a monopetalous flower divided into five obtuſe and erecto-patent ſegments at the limb: there is no pericarpium, the ſeeds, which are four, being contained in the calyx unaltered. See plate CCVIII. fig. 6.

The leaves of ſage of Jeruſalem are accounted pectoral and cardiac, and therefore

PULLIES.



J. Jefferys sculp

BRITISH MUSEUM

fore good in all diſorders of the lungs.

PULMONARY VESSELS, in anatomy, are arteries and veins, which carry the blood from the heart to the lungs, and back again from the lungs to the heart. See the article ARTERY, &c.

The pulmonary artery ariſes from the right ventricle of the heart, and is diſtributed only through the lungs, but with a vaſt number of ramifications. See the article LUNGS.

The pulmonary vein ariſes from the left ventricle of the heart, where it firſt forms a ſinus, then is divided into four branches, and afterwards into innumerable ones, which are diſtributed through the whole ſubſtance of the lungs.

PULMONARY CONSUMPTION. See the articles CONSUMPTION and PHTHISIS.

PULP, in pharmacy, the fleſhy and ſucculent part of fruits, extracted by infuſion or boiling, and paſſed through a ſieve.

Some phyſicians alſo uſe the term pulp for the fatteſt, fulleſt, and moſt ſolid part of the fleſh of animals. See FLESH.

PULPIT, *pulpitum*, an elevated place in a church, whence ſermons are delivered: the french give the ſame name to a reading deſk.

Among the antient Romans, the term pulpitum ſignified the ſtage of a theatre; or, according to ſome, an eminence on the ſtage, for the muſic; or a ſuggeſtum whence declamations, &c. were ſpoke.

PULSATILLA, the PASQUE-FLOWER, in botany, a genus of the polyandria-polygynia claſs of plants, the flower of which conſiſts of ſix plane, erect, acuminated, and long petals; there is no pericarpium; the ſeeds, which are numerous, compreſſed, and hairy, being diſpoſed on an oblong, capitated, and hairy receptacle. See plate CCXI. fig. 3.

PULSE, *pulſus*, in the animal œconomy, denotes the beating or throbbing of the heart and arteries. See the articles HEART and ARTERY.

No doctrine has been involved in more difficulties than that of pulſes; ſince, in giving a phyſiological account of them, phyſicians have eſpouſed quite oppoſite ſentiments; whilſt ſome doubt whether the pulſe is owing to the ſyſtole or diaſtole; as alſo, whether the motion of the heart, and arteries, is one and the ſame, for a moment of time. See the articles SYSTOLE and DIASTOLE.

With regard to motion, the pulſes are reckoned only four, great and little, quick and ſlow. When quickneſs and greatneſs are joined together, it becomes violent; and when it is little and ſlow, it is called a weak pulſe. They are alſo ſaid to be frequent and rare, equal and unequal; but theſe are not the eſſential affections of motion. Frequency and quickneſs are often confounded with each other. A pulſe is ſaid to be hard or ſoft, with regard to the artery, according as it is tenſe, renitent, and hard, or flaccid, ſoft, and lax; for the diſpoſition of the arteries contribute greatly to the change of the pulſe; wherefore it ſometimes happens, that the pulſe in both arms is not alike, which is very common in a hemiplexy. Add to theſe a convulſive pulſe, which does not proceed from the blood, but from the ſtate of the artery, and is known by a tremulous ſubſultory motion, and the artery ſeems to be drawn upwards: this in acute fevers, is the ſign of death; and is ſaid to be the pulſe in dying perſons, which is likewiſe generally unequal and intermitting. A great pulſe ſhews a more copious afflux of the blood to the heart, and from thence into the arteries; a little pulſe, the contrary. See the article CIRCULATION.

The pulſes of perſons differ according to the largeneſs of the heart and veſſels, the quantity and temperies of the blood, the elaſtic force of the canals; as alſo with regard to the ſex, age, ſeaſon, air, motion, food, ſleep, watchings, and paſſions of the mind. The pulſe is larger and more quick in men than in women; in the bilious and ſanguineo-bilious, than in the phlegmatic and melancholic. Thoſe who are lean, with tenſe fibres, and larger veſſels, have a greater and a ſtronger pulſe, than thoſe that are obeſe, with lax fibres and ſmall veſſels; whence they are more healthy, robuſt, and apt for labour. In children, the pulſe is quick and ſoft; in adults, greater and more violent. In the old, it is commonly great, hard, and ſlow. Labour, motion, and exerciſe of the body increaſe the circulation of the blood, the excretions, and particularly reſpiration; reſt renders the circulation ſlow and weak; intenſe ſpeaking increaſes the circulation, and conſequently renders the pulſe large and quick. In watching, the pulſe is more evident; in ſleep, more ſlow and languid. After drinking hot things, ſuch as coffee and tea, or hot bath-waters, as well as after meals, the pulſe vibrates more quick. But nothing produces a greater change in the pulſe than affections of the mind; in terror it

is unequal, ſmall, and contracted; in joy, frequent and great; in anger, quick and hard; in ſadneſs, ſlow, ſmall, deep, and weak; and in intenſe ſtudy, languid and weak. With regard to the air, when after the predominancy of a weſt or ſouth-wind, it becomes north or eaſt, the pulſe is ſtronger and larger; as alſo when the quickſilver riſes in the barometer. But when the atmoſphere is denſe, humid, rainy, with a long ſouth-wind; as alſo where the life is ſedentary, the ſleep long, and the ſeaſon autumnal, the pulſe is languid and ſmall, and the perſpiration decreaſed. In May it is great, and ſometimes violent; in the middle of ſummer, quick but weak; in the autumn, ſlow, ſoft, and weak; in the winter hard and great. A draſtic purge and an emetic render the pulſe hard, quick, and weak, with loſs of ſtrength; chalybeates, and the bark render it great and robuſt, and the complexion lively; volatiles amplify and increaſe the pulſe; acids and nitrous remedies refrigerate the body, and appeaſe the pulſe; opiates and the like, render it ſmall and weak, and decreaſe the elaſticity of the ſolids; whereas things abounding with a friendly ſulphur increaſe the pulſe; but poiſons render it ſmall, contracted, and hard. When the quantity of the blood is too great, bleeding raiſes the pulſe.

The ſeveral indications of the pulſe in different diſorders, may be ſeen under the reſpective names of theſe diſeaſes.

PULSE is alſo uſed for the ſtroke with which any medium is affected by the motion of light, ſound, &c. through it. See the articles MEDIUM, LIGHT, &c.

Sir Iſaac Newton demonſtrates, that the velocities of the pulſes in an elaſtic fluid medium (whoſe elaſticity is proportionable to its denſity) are in a ratio compounded of half the ratio of the elaſtic force directly, and half the ratio of the denſity inverſely; ſo that in a medium whoſe elaſticity is equal to its denſity, all pulſes will be equally ſwift.

PULSE, *legumen*, in botany, a term applied to all thoſe grains or ſeeds which are gathered with the hand, in contradiſtinction to corn, &c. which are reaped, or mowed: or it is the ſeed of the leguminous kind of plants, as beans, vetches, &c. but it is by ſome uſed for artichokes, aſparagus, &c.

PULSION, the act of driving, or impelling a thing forwards.

PULTOWAY, or POELTWA, a town of Ruſſia, in the province of Ukrain, ſituated in eaſt long. 35°, north lat. 50°.

PULVERIZATION, *pulverizatio*, the art of pulverizing, or reducing a dry body into a fine powder; which is performed in friable bodies, by pounding or beating them in a mortar, &c. but to pulverize malleable ones, other methods muſt be taken. To pulverize lead, or tin, the method is this: rub a round wooden-box all over the inſide, with chalk; pour a little of the melted metal nimbly into the box; when, ſhutting the lid, and ſhaking the box briſkly, the metal will be reduced to powder. See the article GRANULATION.

PULVINATED, in the antient architecture, a term applied to a frieze which ſwells or bulges out in the manner of a pillow.

PULVIS, a POWDER. See POWDER.

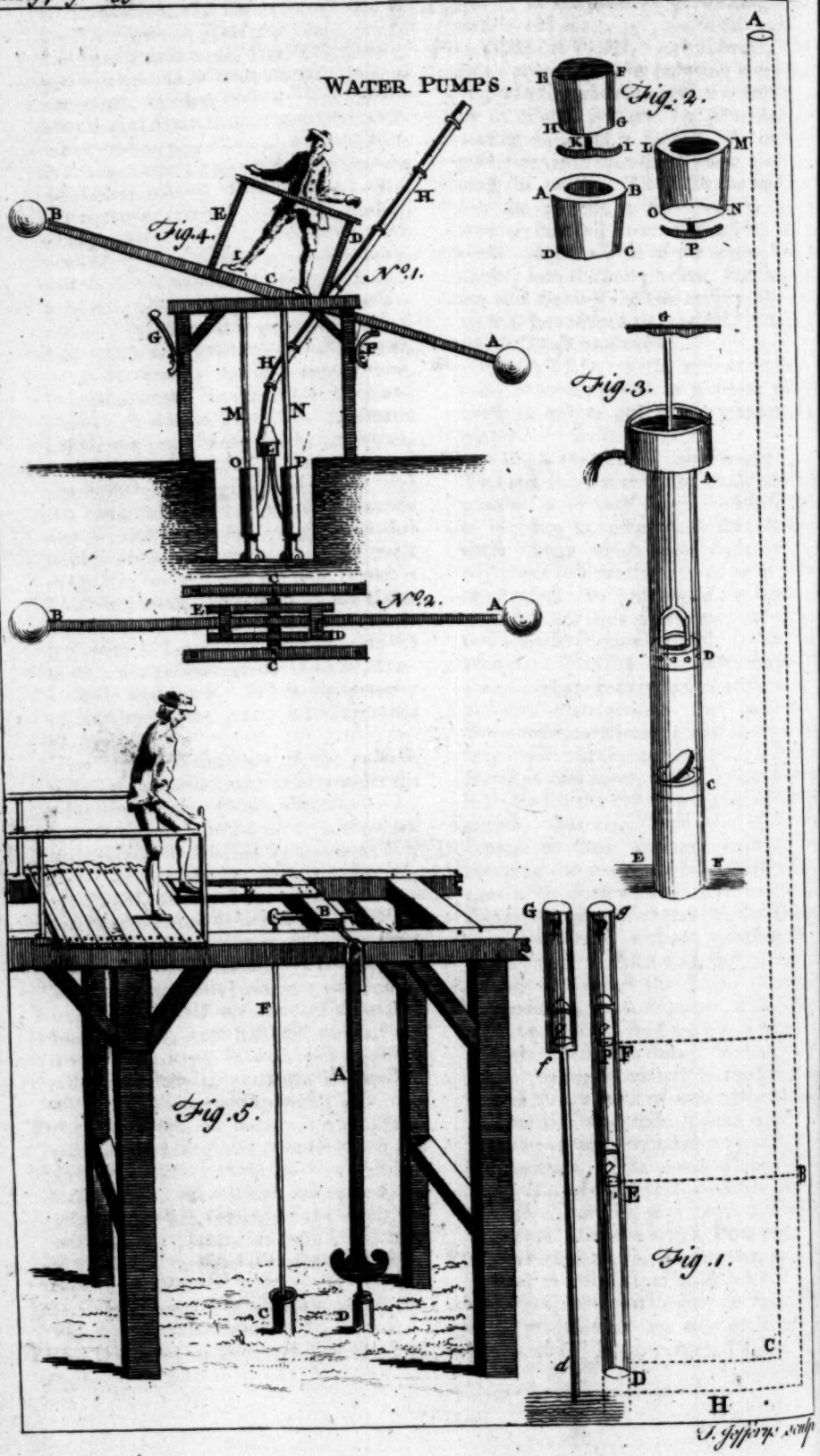
The operation of reducing medicines into powder is ſo very ſimple in itſelf, that it requires no other ſkill than having thoſe things which come under its management ſufficiently dry, in order to be ſo divided. In judging of the fitneſs of materials for this treatment, only theſe two conſiderations neceſſarily require our attention. The firſt is, whether the things themſelves are thus reducible without any previous management that may hurt their medicinal virtues? and next, whether their virtues are conveniently preſerved in this form, when reduced into it? Under the firſt of theſe it naturally occurs, that viſcid and oily ſubſtances cannot be thus managed without firſt reducing them to ſome brittleneſs, which cannot be done without drying: if ſuch things, therefore, cannot be ſufficiently dried for triture, without exhaling their better parts, or deſtroying that particular quality for which the ſimple is valued in medicine, as it happens with many ſeeds and gums, they are much better in any other form than this. The other requiſite in this form, relating to the preſervation of things reduced into it, directs not to preſcribe materials therein which are volatile, or will any other way change in the open air. The preparations, intentions, &c. of the ſeveral powders uſed in medicine, may be ſeen under their ſeveral heads. See the article POWDER.

PULVIS FULMINANS, among chemiſts, a powder ſo called from its ſmart and loud exploſion, when it begins to melt after being placed upon an iron-plate over a gentle fire. It is prepared thus: take

three

BRITISH MUSEUM

WATER PUMPS.



three ounces of purified nitre, two ounces of ſalt of tartar, and one ounce of brimſtone, and grind them well together in a mortar; then putting a ſmall quantity, as about half a dram, over the fire, in the manner already mentioned, it will make a great exploſion. The more philoſophical way of accounting for this effect of the pulvis fulminans is, according to Dr. Shaw, by ſuppoſing that the acid ſpirits of the nitre and ſulphur being looſened by the heat, ruſh towards one another, and towards the ſalt of the tartar with ſo great a violence, as by the ſhock at once to turn the whole into vapour and ſmoke.

PUMICE, in natural hiſtory, a ſlag or cinder of ſome foſſil, originally bearing another form, and only reduced to this ſtate by the action of the fire, though generally ranked by authors among the native ſtones. It is a lax and ſpungy matter, frequently of an obſcure, ſtriated texture in many parts, and always very cavernous and full of holes; it is hard and harſh to the touch, but much lighter than any other body that comes under the claſs of ſtones. It is found in maſſes of different ſizes, and of a perfectly irregular ſhape, from the bigneſs of a pigeon's egg to that of a buſhel. We have it from many parts of the world, but particularly from about the burning mountains Ætna, Veſuvius, and Hecla, by whoſe eruptions it is thrown up in vaſt abundance; and being by its lightneſs ſupported in the air, is carried into ſeas at ſome diſtance by the winds, and thence to diſtant ſhores. The great uſe of the pumice among the antients, ſeems to have been as a dentifrice, and at preſent it is retained in the ſhops on the ſame account.

Pumice-ſtones, on being imported, pay a duty of 2s. $6\frac{80}{100}$d. the ton; and draw back, on exportation, 2s. 3d.

PUMMEL. See the article POMMEL.

PUMP, *antlia*, in hydraulics, a machine formed on the model of a ſyringe, for raiſing of water. See SYRINGE.

The theory of pump-work depends, in a great meaſure, upon the properties of the inverted ſyphon; thus let A B C D E F G (plate CCXVI. fig. 1.) repreſent an inverted ſyphon, A B C D a column of air, and D G the lower part of the pipe of a pump immerſed in the water of the well H I. Let P be the piſton of the pump at E in its loweſt ſituation, and at F in its higheſt. Now as both theſe parts communicate with the water, one by preſſing on it, the other by opening into it, they may be looked upon as communicating with one another. Wherefore A B C D, the column of air, would by its weight or preſſure force up a column of water into the pipe D G to the height of thirty-two feet, were the air exhauſted from the ſaid pipe, and continued to that height; ſince the weight of a column of air is equal to that of ſuch a column of water of the ſame baſe. If, therefore, the piſton P be thus thruſt down to E, meeting the water there, and from thence it be raiſed to F with an uniform motion, the water will riſe from E to follow the piſton with a variable motion; the leaſt of which is as $\sqrt{AC-DE}$, and the greateſt as $\sqrt{AC-DE}=\sqrt{AB}$.

If in lifting up the piſton, the velocity of the water be leſs than that of the piſton, it will not be able to follow it; but will leave a ſpace between them, which will increaſe more and more as the velocity of the water becomes leſs than that of the piſton. The conſequence of this will be, that a part of the ſtroke of the piſton will be loſt; and not only that, but the piſton, when the water leaves it, will riſe very hard, as having a weight of water upon it, and the air of greater denſity above than below; whence the equilibrium, which ought to be in pumps, is deſtroyed, and the ballance againſt the workman. Now as this can happen even where the diameter of the ſucking-pipe is equal to that of the pump-barrel, it muſt happen much ſooner when the ſucking-pipe is leſs than the barrel; becauſe the water riſing through a leſs paſſage will be longer in filling the pump-barrel, and conſequently muſt quit the piſton, and leave the greater void ſpace between. On the contrary, if the leaſt velocity of the water, riſing into the pipe, be greater than that of the piſton, there will be no void ſpace; and the pump-barrel may be made in proportion as much wider than the ſucking-pipe, as the velocity of the water is greater than that of the piſton. Now that this may be the caſe, we ſhall ſhew by calculation what diameters the barrel and pipe ought to have, compared with the velocity of the water and piſton. Let A (*ibid.*) repreſent the leaſt altitude of the atmoſphere A C = 31 feet of water; B = D F the higheſt elevation of the piſton above the ſurface of the

water H I, which let be 16 feet. And let the greateſt velocity of the piſton which can well be given to a pump be that of four feet in a ſecond $= v$; and V = the leaſt velocity of the water that riſes in the pipe; D = the diameter of the barrel; and d = the diameter of the pipe.

Now here we have $\sqrt{A} - \sqrt{B} = V =$ the leaſt velocity of water; and the fall which will produce that velocity is the ſquare of that expreſſion, *viz.* $A + B - 2\sqrt{AB}$, that is, $31 + 16 - 2\sqrt{31 \times 10} = 2$ feet 6 inches, the height of the fall required. Whereas, by the common way of taking the ſquare of $\sqrt{A - B}$, *viz.* A—B for the height, we have 15 feet for the fall, which extraordinary error muſt be of very bad conſequence in practice.

Here the velocity $\sqrt{A} - \sqrt{B} = \sqrt{31} - \sqrt{16} = 5,6 - 4 = 1,6$ per ſecond. The velocity of the water, at the bottom of the pipe D, is as $\sqrt{A} = 5,6$; that alſo muſt be the velocity of the piſton at D, that the water may follow it; whence the piſton moving with the ſame velocity at F, where the velocity is but 1,6, we have 5,6—1,6 = 4 feet of void ſpace; therefore 4 parts in 5,6 of ſuch a ſtroke, would be loſt or ineffectual. We may here obſerve, by the way, that ſince the velocity of the water at D is 5,6, and the greateſt velocity which can be given to the piſton (without damaging the machinery) is but 4; therefore a piſton, working at the lower end of the pipe or barrel, will always have water more than enough to prevent any void ſpace or loſs of labour. But, ſince we find ſo great a void in the pipe at F of the ſame diameter with the piſton, it is evident, if we contract all the part below F into a ſmall pipe as FD, and let the part F G remain as it was for the barrel for the piſton to play in, as at FG, that then the water will riſe into the barrel FG with a greater velocity than before, in proportion as the pipe is leſs; conſequently, if the bore of the pipe FD be to that of the barrel FG, as the velocity of the piſton P, or the water in the barrel, is to the velocity of the water in the pipe, there will always be a ſufficiency of water to prevent a vacuum in the barrel. Which rule in ſymbols is thus expreſſed, $DD : dd :: V : v$; whence $D^2 v = d^2 V$ for a general canon; any three of which quantities being given, the fourth may be found. Thus, for example, ſuppoſe D, v, and V were given to find d, we have $d = \frac{D\sqrt{v}}{\sqrt{V}}$. Let the diameter of the barrel D = 6 inches; and ſuppoſe the piſton gives 20 ſtrokes in a minute, each a two feet ſtroke, ſpending as much time in its aſcent as deſcent; then will the motion of the piſton be 80 feet per minute, or $1\frac{1}{3}$ per ſecond; whence $v = 1\frac{1}{3}$. Laſtly, to obtain the value of V, we muſt fix on the length of the pipe FD *(ibid.)* which let be 16 feet; then the higheſt elevation of the piſton will be 18 feet (if it comes to the bottom of the barrel, as it ought to do); wherefore, an height of water of 18 feet in the pump GD, acts againſt the weight or height of 31 feet in the leg A C. Now the velocity V of the water in the pipe FD being uniform, or conſtantly the ſame, we muſt find what difference of uniform velocities will be generated by falls from 31 and 18 feet heights. Thus $\sqrt{16\frac{1}{9}} : 32 :: \sqrt{31} : 43$ nearly; and $\sqrt{16\frac{1}{4}} : 32 :: \sqrt{18} : 32\frac{3}{4}$; whence the difference of theſe uniform velocities will be $43 - 32\frac{3}{4} = 10\frac{1}{4} = 10$ feet three inches per ſecond; therefore $V = 10\frac{1}{4}$. Wherefore $\frac{D\sqrt{v}}{\sqrt{V}} = d = 2\frac{1}{10}$ inches of the diameter of the pipe FD.

The reaſon why we make no uſe of the expreſſion $\sqrt{AC} - \sqrt{DF}$ in this caſe, is, becauſe this gives only the difference of the inſtantaneous velocities, or the leaſt velocity with which the water at F can begin its motion upwards; whereas we here want to find what the conſtant and uniform motion of the water will be, or how much it will ſupply every ſecond uniformly, which is done by the method above. For, ſince a fall of $16\frac{1}{9}$ gives an uniform velocity of 32 feet per ſecond, a fall of 31 feet will give 43; thus a fall of 18 feet will give $32\frac{3}{4}$, and their difference muſt be that of the water at F.

If we know the velocity of the piſton v, the diameter of the barrel D, and the diameter of the pipe d, we ſhall find the velocity of the water in the pipe V, $= \frac{vDD}{dd}$; or thus in words, multiply the ſquare of the diameter of the barrel by the velocity of the piſton; divide the product by the ſquare of the diameter of the pipe, the quotient will be the velocity ſought

ſought from the water in the pipe. This velocity, when found, muſt be taken from 43, the remainder 43 — V will be the uniform velocity produced by a fall from the higheſt ſituation of the piſton to the loweſt ſurface of the water in the well, and which is found by ſaying, as $32 : \sqrt{16\frac{1}{2}} :: 43 - V : \sqrt{DF}$; whence DF, the higheſt elevation of the piſton, will be known.

When we know D, V, and d, we find v the velocity of the piſton by this theorem $\frac{V d d}{D D} = v$; that is, in words, multiply the ſquare of the diameter of the pipe by the velocity of the water in it, and divide the product by the ſquare of the diameter of the barrel, the quotient is the velocity of the piſton required.

Having given the velocity of the water in the pipe V, the diameter of the pipe d, the velocity of the piſton v, to find the diameter of the barrel D, we have this theorem $D = \sqrt{\frac{V d d}{v}}$; that is, multiply the ſquare of the diameter of the pipe by the velocity of its water, and divide that product by the velocity of the piſton; the ſquare root of the quotient is the diameter of the barrel ſought.

We ſhall now proceed to the deſcription of two or three of the moſt uſeful pumps, but firſt give an account of that ſort of valves which are exceeding good, and ought to be uſed in pumps, and all kinds of water-engines, where valves are neceſſary.

Let A B C D (*ibid.* fig. 2.) be the bucket of a piſton, or any other part where a valve is required; in the middle there is a circular but tapering hole from top to bottom, in which is fitted the tapering or conical piece E F G H, with a piece I K to be ſcrewed in and out of the bottom part H G. It is to be ſcrewed out, when the ſaid ſolid E G is put into its place or hole in A C; and afterwards ſcrewed in, when the whole together appears as in the figure L M N O P. The piece E G now becomes a valve, or capable of permitting the water to aſcend, and to prevent its deſcent.

That the water puſhing againſt the bottom of the valve will raiſe it upwards, is evident from the conical form thereof, and its lying in the hole only by its own weight; the length of the key at K being ſufficient to permit ſuch a riſe of the valve, as will admit a ſpace between it and the hole for the water to paſs as freely as required: and, that the valve may not be thrown quite out of the hole, the croſs piece I is added, of a greater length than the diameter of the loweſt part of the valve.

If the valve E G and its ſocket A C be of braſs, and fitted, by grinding them with emery firſt and putty afterwards, with a drill-bow into each other, they will not only be water-tight, but even air-tight; and that too, if but ſlightly touched with the emery or putty: for if they are ground to a poliſh, the attraction of coheſion will take place, and prevent the valve from riſing ſo freely as it ought to do; yea, ſometimes thoſe ſurfaces have been found to cohere ſo ſtrongly, that the force of the riſing water could not overcome it: but all this would be prevented, and every thing ſucceed to one's wiſh, if they were made as above directed, as has been found by long experience and trying every way.

Kinds and ſtructure of PUMPS. Pumps are diſtinguiſhed into ſeveral kinds, according to the different manners of their acting; as the common ſucking pump, forcing pump, lifting pump, mercurial pump, *&c.*

1. The ſtructure and action of the common ſucking pump, as it is called, has been ſo far deſcribed in the above theory of pumps, that little remains to be ſaid on it. However, it may not be improper to give a figure or two of this kind of pump, in order to ſhew its ſtructure, and the contrivances uſed in working it. Fig. 3. *ibid.* repreſents a ſimple ſucking pump, in which A is the ciſtern; A B, the barrel or pipe, ſtanding in the water E F; G D, the piſton and bucket, with its bucket and valve D; and C, the valve open for the aſcent of the water. Fig. 4. *ibid.* n° 1 and 2. is a very ſimple and uſeful contrivance for making two pumps by means of the ballance A B, having large iron-balls at each end, placed in equilibre on the two ſpindles C, as repreſented in the figure; on the right and left are two boards I, nailed to two croſs-pieces faſtened to the axis of the machine. On theſe two boards, the perſon who is to work the pumps, ſtands, and ſupports himſelf by four poſts, E, D, erected perpendicularly, and having croſs-pieces on the top. At the diſtance of ten inches on each ſide of the axis, are faſtened the piſtons M, N, which go to the ſuckers. The man, by leaning alternately on his right and left foot, puts the

the ballance in motion, by which means the pumps O, P, are worked, and the water thrown into the pipe H, and carried to a height proportional to the diameter of the valves, and the action of the ballance. It will be neceſſary to place on each ſide an iron-ſpring, as F, G, in order to return the ballance, and prevent its motion from being too great. Fig. 5. *ibid.* is another machine for working two pumps, where A repreſents a large weight faſtened to the axis, to regulate the motion of the machine. On each ſide of the axis B, is a piſton which goes to the ſuckers of the two pumps C, D. The machine is put in motion by the man's treading on the board E, and, conſequently, the two pumps deliver water alternately. All which is ſo plain from the figure, that it needs no farther deſcription.

2. The forcing pump has already been ſufficiently explained under the article FORCER.

3. The lifting pump is only a forcing pump of another ſtructure, repreſented in plate CCXVII. fig. 1. where AB is a barrel, fixed in the frame KILM; which alſo is fixed immoveable, with the lower part in the water to be exhauſted. GEQHO is a frame with two ſtrong iron-rods, moveable through holes in the upper and lower parts of the pump IK and LM: in the bottom of this frame is fixed an inverted piſton BD, with its bucket and valve upon the top at D. Upon the top of the barrel, there goes off a part KH, either fixed to the barrel, or moveable by a ball and ſocket, (as here repreſented at F) but in either caſe ſo very nice and tight, that no water or air can poſſibly get into the barrel, which would ſpoil the effect of the pump. In this part, at C, is fixed a valve opening upwards. Now when the piſton-frame is thruſt down into the water, the piſton D deſcends, and the water below will ruſh up through the valve D, and get above the piſton; where, upon the frame's being lifted up, the piſton will force the water through the valve C up into the ciſtern P, there to run off by the ſpout. Note, this ſort of pump is ſet ſo far in the water, that the piſton may play below the ſurface of it.

Another excellent pump of the lifting ſort, is repreſented, *ibid.* fig. 2. which has this peculiarity, that its piſton works without friction. Its ſtructure is this: ABCDEFGHIKL is a kind of a box incloſing the piſton; this box conſiſts of two parts, *viz.* one upper, ABCIKL, and the under one, DEFGH, which ſhut upon each other. The piſton within, *ab*, is a circular piece of wood; about the circumference of which is nailed a piece of well-ſeaſoned leather, of a circular form, and ſo wide, that when the piſton is placed at the bottom of the box, the leather may lie over the ſides thereof at DH all around. The piſton and leather, thus placed on the upper part, is forced down upon the under one, and then both parts ſcrewed very faſt together. The manner of which is very eaſy to apprehend from the figure, where *igfdhk* is the leather going from the piſton through the jointure of the box. Upon the upper part of the piſton is fixed a circular (or any figured) piece of iron or wood, denoted by *def*, in the top of which, at *e*, is fixed the rod of the piſton QC, by which the piſton is drawn up towards the upper part of the cavity *ln*, and from thence forced down again in working the pump. Now as the diameter of the piſton is leſs than that of the cavity, it is plain that in its motion up and down no friction can happen, as there are no parts for it to rub againſt, which is occaſioned by the contrivance of ſuſpending it on the leather. In the bottom part is fixed a pipe, FO, to bring up the water from the mine or well at O, which it delivers into the box by a valve at *c*. In the middle of the piſton is likewiſe another valve *m*, opening upwards. AMNL is a tube or cylindric pipe, in which the water is raiſed to a ciſtern to run off. It is eaſy to obſerve, that as the piſton is drawn up, the water will run in beneath, through the valve *c*, to prevent a vacuum; and alſo, that when the piſton is forced down, the water in the lower parts muſt be forced up through its valve; and when the piſton is raiſed again, the water above it will be forced up the pipe AM to the ciſtern. Another thing peculiar to this pump is, the ſhortneſs of the ſtroke of the piſton, which is compenſated by the largeneſs of its area, and the greater number of ſtrokes that may be made in the ſame time. The only objection to this pump is, that it is always charged with the weight of ſo much water, as is equal to a column of water, whoſe baſe is equal to the area of the piſton, and the height equal to that of the reſervoir.

4. The mercurial pump, or that which works

PUMPS.

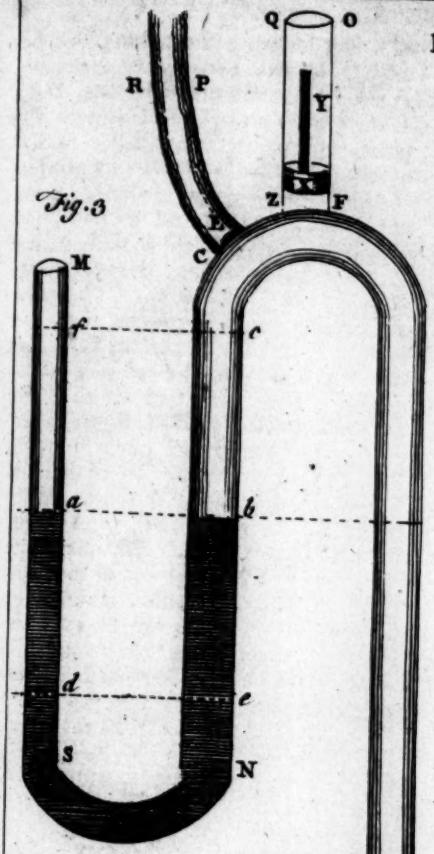


Fig. 3

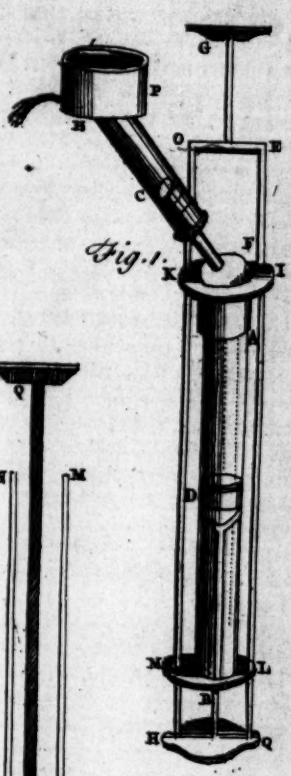


Fig. 1.

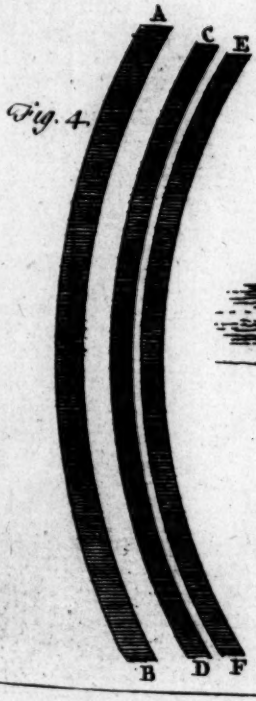


Fig. 4.

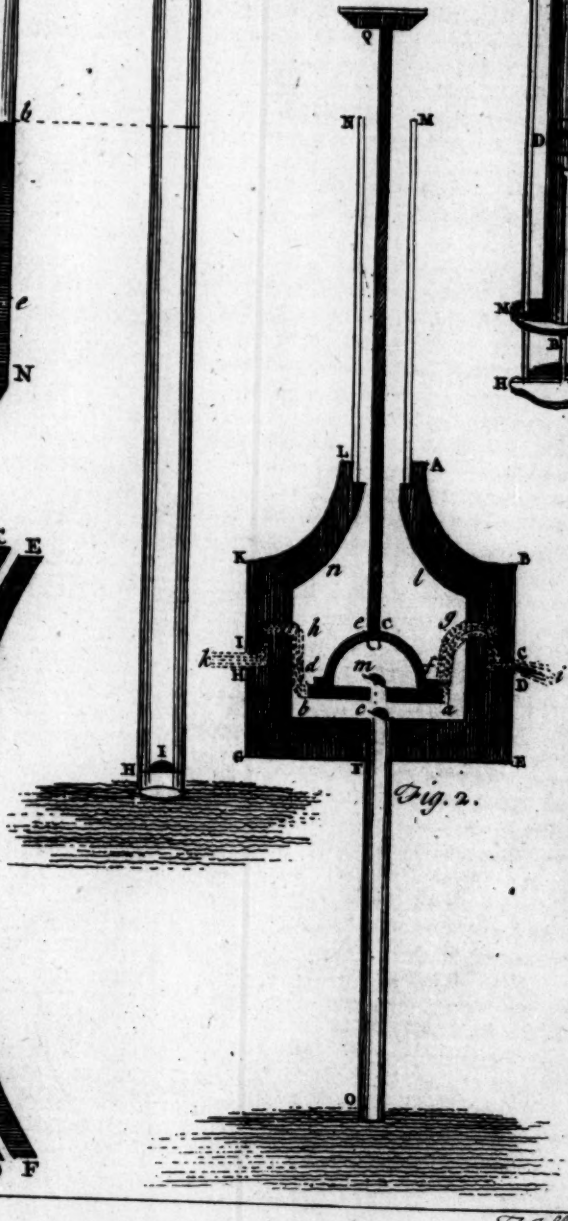
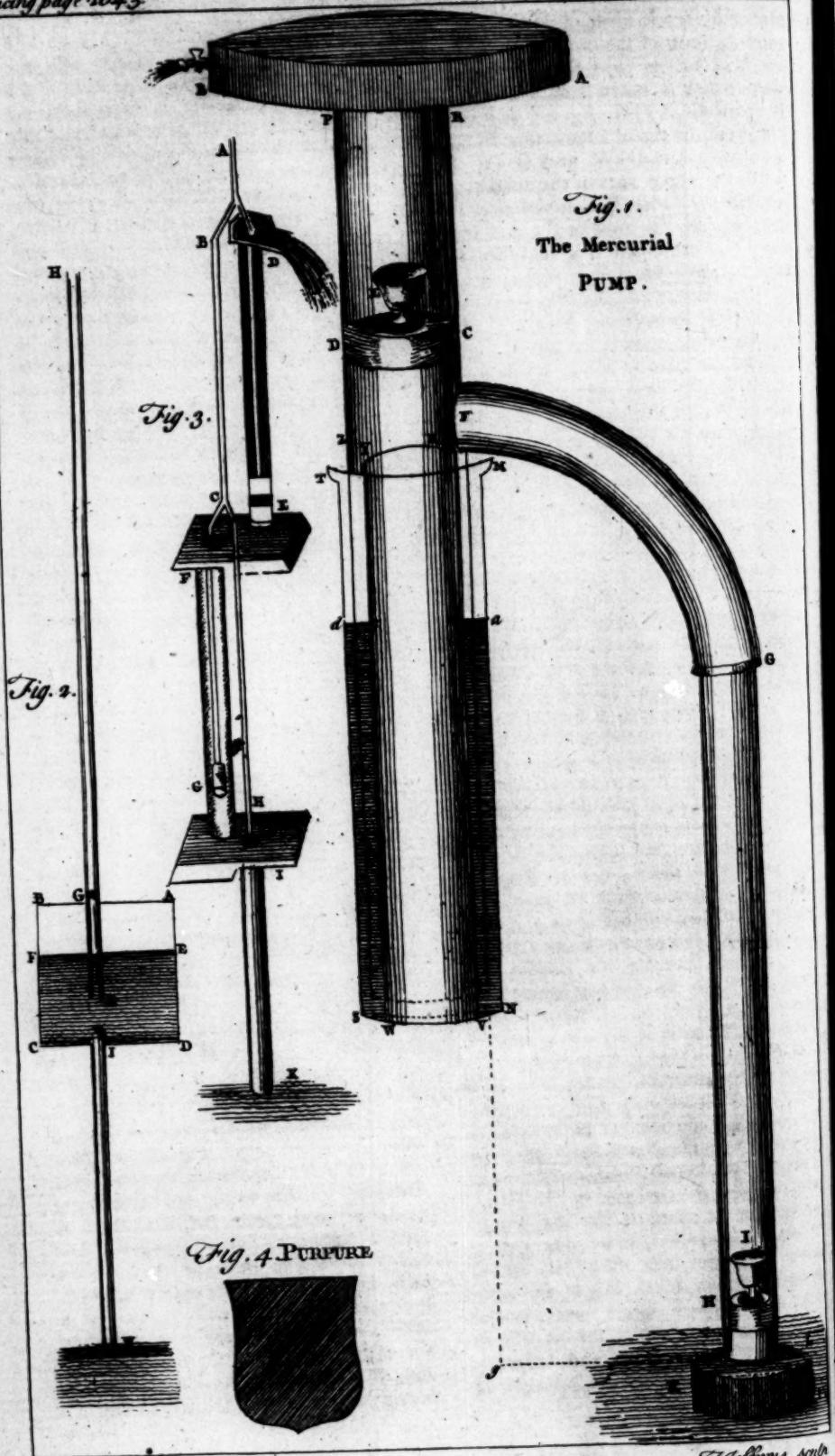


Fig. 2.

T. Jefferys sculp

BRITISH MUSEUM

BRITISH MUSEUM


A
B
F
R
C
D
H
Fig. 3.
E
T
M
d
a
G
Fig. 2.
K
I
L
X
S
V
N
Fig. 1.
The Mercurial
PUMP.
Fig. 4 PURPURE
T. Jefferys Sculp.

works by quick-ſilver, being one of the moſt curious of the modern inventions, we ſhall be the more full in its deſcription, which is taken from a model. A B (plate CCXVIII. fig. 1.) is a ciſtern placed on the top of a braſs-tube POQR, open at each end PR and OQ. Towards the upper part of the tube at F is inſerted (or ſoldered) a curved pipe FG, opening into the tube at F; and in the end G is cemented a glaſs-tube GH, fixed below in an hollow box LK, full of holes for the admiſſion of water, into which it is immerſed. MNST is an exterior tube, open at the top MT, and cloſe at the bottom NS; in which bottom is firmly fixed another hollow tube VXYW, cloſe on the top XY, which may be a ſolid piece of wood. This inner tube or cylinder of wood goes up into the tube QORP, at the ſame time that this is inveſted by the exterior tube MNST, as is ſeen in the figure. In the lower part of the pipe at H is a diaphragm, and a valve I, opening upwards for the aſcent of water when a vacuum is made. At CD in the main tube, above the inſertion of the pipe, is another diaphragm and valve E, opening upwards alſo to give paſſage to the water in the forcing part of the ſtroke.

Now to explain the peculiar manner of working by quick-ſilver, which for that purpoſe is poured into the exterior tube MS, which, when applied to the pump in its place, will be made to riſe in two cylindric ſhells; one about the tube of the pump outwardly; the other within, about the innermoſt tube or plug XQ, as repreſented in the figure at *a*, *b*, and *c*, *d*. At the bottom there is but one cylindric ſhell, becauſe the middle tube does not reach the bottom, leaving the ſpace VOQW.

From this account it is eaſy to obſerve, that the part COQD anſwers to the barrel of the common pump, FGH to the pipe, the inner tube XQ to the piſton, and the quick-ſilver at bottom to the leathers of the common piſton; for it prevents all communication of the external air and internal part of the barrel, where the vacuum is to be made. Whence it is evident, that upon letting down the outer tube MS, it carries down the inner tube XQ at the ſame time, and makes a larger ſpace in the barrel and pipe, in which the air will be expanded or become rarer, and its ſpring thereby weakened. In conſequence of this, the water will riſe through the valve at I into the pipe, and alſo the mercury will riſe in the inner ſhell by the preſſure of the air on the outer ſhell, till the equilibrium be reſtored: and the height of the water raiſed will be nearly 14 times as great as that of the mercury. When the tube SM is raiſed again, the air will be compreſſed within the barrel; and, its ſpring increaſing, it will act upon the water, the mercury of the inner ſhell, and the valve E; the water above the valve I it cannot move, becauſe of the valve being ſhut below; its whole force is therefore ſpent on the mercury, and valve E; it will act on the inner ſhell of mercury, and drive it down to the level of that in the outer ſhell, as at *a b*, *c d*; and then the preſſure will be every where equal, *viz.* on the inner and outer ſhell, and on the valve E: as the tube after this continues moving up, the air will be farther compreſſed, and its ſpring made greater than that of the outward air, which therefore it will overcome, and ſo thruſt up the valve E, till ſo much has eſcaped as leaves the remainder in equilibrio with the atmoſphere. The two ſhells of mercury will be upon a level all the while the air is going through the valve, becauſe the preſſure is not greater within than without. By repeating the operation a ſecond time, the air will be farther rarified, and the water will again riſe in the pipe; and thus on, till the pipe and barrel be full as in the common pump.

This pump made for common uſe, ſhould have the following dimenſions: the length of the outer tube MN = 30 inches, of the inner tube XQ = 31 inches, the diameter of the inner tube XY or QO = ſix inches, the thickneſs of the outer tube = $\frac{1}{10}$ of an inch, of the middle one $\frac{8}{100}$ of an inch, and of the inner one $\frac{13}{100}$ of an inch, and the bottom of the tube ZO to come within an inch of the bottom, NS, of the outer tube. Theſe dimenſions afford ſufficient ſtrength, if the tubes or barrels are made of copper, or caſt iron, and of ſuch a diameter, that the diſtance between each may be $\frac{1}{2}$ the tenth of an inch, and this ſhould be nicely effected, by having the tubes truly turned in a lathe. A tranſverſe ſection of a part of the circumference of theſe tubes, with their thickneſſes and the ſpaces between, is repreſented in plate CCXVII. fig. 4. where

where AB is the outer, CD the middle, and EF the inner tube. The ſpaces between are made ſo narrow, becauſe otherwiſe too great a quantity of mercury would be neceſſary; and yet of no manner of uſe, becauſe fluids preſs according to their altitude and not the quantity.

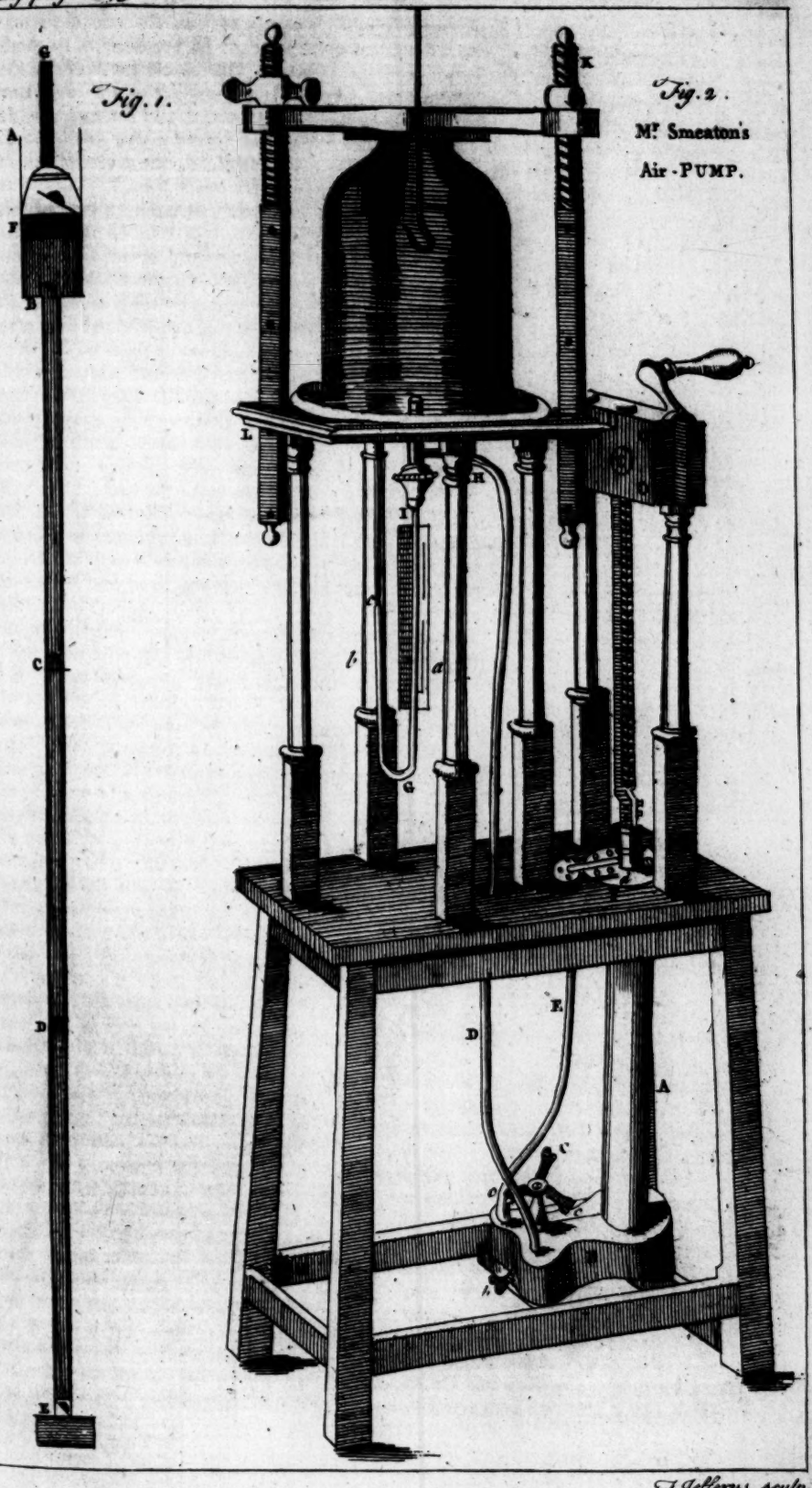
If now every part be fitted for work, and mercury poured in to the height of 24 inches, as ſhewn at *a*NS*d*; and the barrel and pipe be filled with water, ſo that the whole pump be full and in equilibrio with the atmoſphere; and if the outer tube be moved down 14 inches at the commencement of the motion, the equilibrium in the pump is deſtroyed by the greater ſpace, which will enſue upon the deſcent of the tube XQ, and which cannot be ſuffered, becauſe of the preſſure of the air on the water at H, and on the mercury in the outer ſhell at *a*, *d*. And becauſe the preſſures of the air outwardly at H and *a* are equal, but there is not an equal preſſure inwardly on the valve I, and the inner ſhell of mercury *b*, *c*; and the valve being preſſed with all the water in the pipe above it, which is proportional to the altitude *b g*; and the ſurface of the mercury of the inner ſhell at *b*, *c*, being preſſed only with the altitude of water C *b*, it is plain the water will not ruſh in at I, till the preſſure on *b*, *c*, becomes equal to it; and that will be, when the height of the inner ſhell at *b* is greater than that of the outer ſhell at *a* by near $\frac{1}{14}$ part of the difference of the altitude *b g*; and then the preſſure being equal at *b* and I, upon the motion of the tube XQ downwards, the water will be forced up through the valves at I, and the height of the mercury in the inner ſhell will always exceed that in the outer ſhell, in ſuch manner, that the exceſs will be about $\frac{1}{14}$ of *b g*, or the height of the point *b* above the water at H.

When the other tube is in its loweſt ſituation, the mercury in the inner ſhell will be nearly at the top, XY; and in the outer ſhell it will have but a ſmall height as *a* O, or Q*d*. And when the tube MS is drawn up again, the inner tube, XW, will force the water in the pump to act upon the upper part of the valve I, the under part of the valve E, and the ſurface of the mercury at *b*, in the inner ſhell. The valve I is thereby ſhut cloſe, the valve E it endeavours to puſh up but cannot, till it has firſt reduced the mercury in each ſhell to a level; after which, as the tube MS continues its motion upwards, the mercury will riſe in the outer ſhell, the preſſure on the inner one being now greateſt: and for every 14 feet the water is forced above the ſurface of the inner ſhell, *b*, the mercury will riſe in the outer one 1 foot.

The theory of the operation of this complex pump will be much more eaſily underſtood from conſidering the ſyphon, HG FZNSM (plate CCXVII. fig. 3.) which, though very ſimple, acts on the very ſame principles. HGF is the water-pipe, as in the pump; ZN repreſents the inner cylindric tube, and MS the outer one; OFZQ is the barrel in which the piſton YX moves (which is a forcer, or without a valve,) and CR a conduit-pipe to carry away the water forced through the valve E. In all this it is eaſy to ſee the analogy between this ſyphon and the mercurial pump. Its operation likewiſe is the ſame.

For let mercury be poured into the legs MS and ZN, it will come to a level at *a*, *b*. Now ſuppoſe the other part of the ſyphon full of water, and the piſton raiſed, it is plain the water at H cannot open the valve I, till a column of mercury be raiſed in the leg ZN above the ſurface of that in the outer leg MS, ſufficient to ballance the weight of the water in the pipe HF; then will the preſſure of the air be equal upon the water H, and the mercury in the leg MS; and as the motion of the piſton is continued, the water and mercury will continue to riſe with equal momenta, and therefore the mercury will riſe 1 inch for every 14 inches nearly, till the piſton ſtops.

When this happens, the ſurface of the mercury in the leg ZN will be at *c*, and that in the leg MS at *d*; and now, if the piſton be puſhed down again, it will cauſe the water to ſhut the valve I, and to act on the mercury at *c*, and on the valve at E, but the preſſure of the air at E will not ſuffer the valve to riſe till the preſſure there be greater within than without, which it cannot be till the ſurface of mercury in the outer leg MS be higher than that in the inner one; wherefore before the valve E can open, the mercury in each leg muſt come again to the level *a*, *b*; after which, the mercury will riſe in the outer leg MS, ſo as to be always in equilibrio with the water in the conduit tube RC, and the part C *e* of the inner leg



T. Jefferys sculp

BRITISH MUSEUM

leg; ſuppoſing the mercury now ſtands at *e* in that, and at *f* in the other: and then the ſaid height of the water will be nearly 14 times the height *df*, or *ce*. All this is very eaſy to underſtand from the common principles of hydroſtatics; and if this be underſtood, the nature of the pump muſt, as being the very ſame machine with a different diſpoſition of its parts.

From this theory of the mercurial pump, it is eaſy to infer, that in conſtructing one, the part ZFOQ ought to be placed in the middle of the height from the water H to be raiſed, to the ciſtern AB which receives and delivers it; or more nicely, the level ſurface *abcd* of the mercury when the pump is full, and juſt going to work, ought to be in the middle point of the line R*g*; the reaſon is, becauſe in the deſcent and aſcent of the tube MS, the differences between the altitudes of the outer and inner ſhells *ad* and *cb* are equal, and in each caſe a 14th part of the height of the water below or above it.

Suppoſe the whole height from the water to the piſton be R*g*=60 feet; then *a*R =*ag*= 30 feet, or 360 inches; then alſo 14)360(26 nearly, that is, the difference of the altitudes in the mercurial ſhells will be about 26 inches. The place therefore where they ought to be on a level is at leaſt 13 inches below M, or the quick-ſilver muſt never be poured in to a height N*a* greater than about 15 or 16 inches, or 17 at moſt. If the height R*g* be greater than 60 feet, the tubes MS, *&c.* muſt be proportionably enlarged.

General obſervations on PUMP-WORK. From what has been ſaid under the articles FLUID, ATMOSPHERE and GRAVITY, we preſume the reaſon will appear ſufficiently evident, why no ſingle pump, though perfectly tight, can raiſe water by a piſton playing at a greater diſtance than 32 feet; nor can this be remedied by ſeveral valves in the pipe below the piſton, as ſome have pretended: for let AB (plate CCXIX. fig. 1.) be the barrel of a pump, GF the piſton, BE a pipe going from the barrel to the water at E, 60 feet below it; and let B, C, D, E, be 4 valves placed in the pipe at 20 feet diſtance from each other. Now when the piſton is drawn up from B to F, a vacuum will be made between, but the valve B will not riſe by the water below it; for the water in the part BC cannot riſe itſelf, much leſs can that in the part CD below it, as being preſſed with the weight of the column above, and its own weight downwards, therefore no part of the watry column BF can move of itſelf, or by itſelf. Now no power can be applied any where but at E to move the whole column; nor can the whole be moved without raiſing all the valves at once; therefore the power able to raiſe the valve at E, and conſequently the valve at B, muſt be able to overcome the preſſure of a column of water 60 feet high: but the air can ſuſtain a column only of 32 feet high; therefore the air cannot raiſe the valve E, nor any of the reſt; and conſequently, the water cannot riſe in the barrel AB of a ſingle pump, if longer than 32 feet.

However, we may raiſe water by a compound-pump, ſuch as is repreſented in (plate CCXVIII. fig. 3.) where A is the rod of the piſton, which at B is divided into two, one of which goes to the barrel DE, and draws up the water from the ciſtern EF; the other part BC goes down to the ſaid ciſtern, where it is divided at C into two other parts; one going to the pump FG, ſupplies the water to the ciſtern EF; the other part CH goes to another pump IK below, and draws up the water from K to the ciſtern HI. Now theſe pumps all working at once, will draw water from any depth, provided each pump does not exceed 32 feet in height.

We ſhall conclude this ſubject with an account of one other method of raiſing water, by the natural agency of heat and cold only. It is as follows: ABCD (*ibid.* fig. 2.) is a pretty large veſſel filled with water to the height EF, the ſpace above being full of air. On the upper part of the veſſel is a tall tube inſerted GH, and deſcends below the ſurface of the water to K. On the nether part is another tube or pipe IW. In each tube is a valve opening upwards, as at I and G. The body of this inſtrument being nicely cloſed every where, ſo that no air can eſcape, and placed with the lower end in the water W, and thus continued in the hot ſun of a ſummer's day, the air will be rarified by the heat of the ſun in the upper part, and will compreſs the ſubjacent water, and force it up through the valve G into the tube GH, and by the cold of the following night it will be condenſed again; and then the preſſure of the atmoſphere will force the water at W up the pipe WI, to replenifh the

veſſel each day: and, in this manner, may water be raiſed in a conſiderable quantity in the ſummer ſeaſon, and in hot climates.

By ſuch a contrivance, ſeveral curious effects may be produced: for by uſing a cylindrical cover to the veſſel, the ſun-beams may be collected in ſuch quantity, as to greatly rarify the air contained in it, ſo as to make it force out a conſiderable ſtream of water either through a tube or adjutage: thus alſo, an image may be made to weep in the ſun-beams, or at the approach of fire; with other devices of the ſame kind.

Air-PUMP. Having already given the deſcription of the common air-pump, and alſo that of the portable one, under the article AIR, it only remains to give an account of ſome conſiderable improvements made in that machine by the ingenious J. Smeaton; together with a perſpective view thereof, in plate CCXIX. fig. 2. and alſo a perpendicular ſection, *&c.* of it in plate CCXX. fig. 1, 2, *&c.*

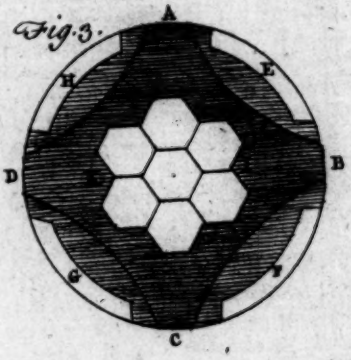
One of the principal cauſes of imperfection in the common air-pumps, ariſes from the difficulty of opening the valves at the bottom of the barrels; to avoid which inconvenience, Mr. Smeaton has made uſe of ſeven holes inſtead of one; by which means, the valve is ſupported at proper diſtances, by a kind of grating, made by the ſolid parts between theſe holes: and to render the points of contact, between the bladder and grating, as few as poſſible, the holes are made hexagonal, and the partitions filed almoſt to an edge. He has alſo made the breadth of each hexagon $\frac{1}{10}$ of an inch, ſo that its ſurface is more than nine times greater than common; upon which account, as well as by reaſon of the greater number of holes, the valve may be raiſed with a ſixth part of the force commonly neceſſary.

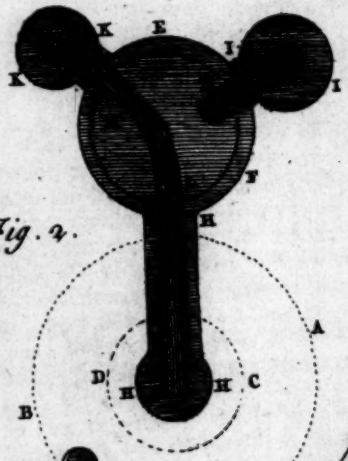
Another imperfection is owing to the piſton's not fitting exactly, when put cloſe down to the bottom; which leaves a lodgment for air, that is not got out of the barrel, and proves of bad effect, by hindering the rarefaction from being carried on beyond a certain degree: for as the piſton riſes, the air will expand itſelf; but ſtill preſſing upon the valve, according to its denſity, it hinders the air within the receiver from coming out. Hence, were this vacancy to equal the 150th part of the capacity of the whole barrel, no air could ever come out of the receiver when once expanded 150 times, though the piſton was conſtantly drawn to the top. This inconvenience Mr. Smeaton has endeavoured to overcome, by ſhutting up the top of the barrel with a plate, having in the middle a collar of leathers, through which the cylindrical rod works, that carries the piſton. By this means, the external air is prevented from preſſing upon the piſton; but that the air, which paſſes through the valve of the piſton from below, may be diſcharged out of the barrel, there is alſo a valve applied to the plate at the top, that opens upwards. The conſequence of this conſtruction is, that when the piſton is put down to the bottom of the cylinder, the air in the lodgment under the piſton will evacuate itſelf ſo much the more, as the valve of the piſton opens more eaſily, when preſſed by the rarified air above it, than when preſſed by the whole weight of the atmoſphere. Hence, as the piſton may be made to fit as nearly to the top of the cylinder, as it can to the bottom, the air may be rarified as much above the piſton, as it could before have been in the receiver. It follows, therefore, that the air may now be rarified in the receiver, in the duplicate proportion of what it could be upon the common principles; every thing elſe being ſuppoſed perfect.

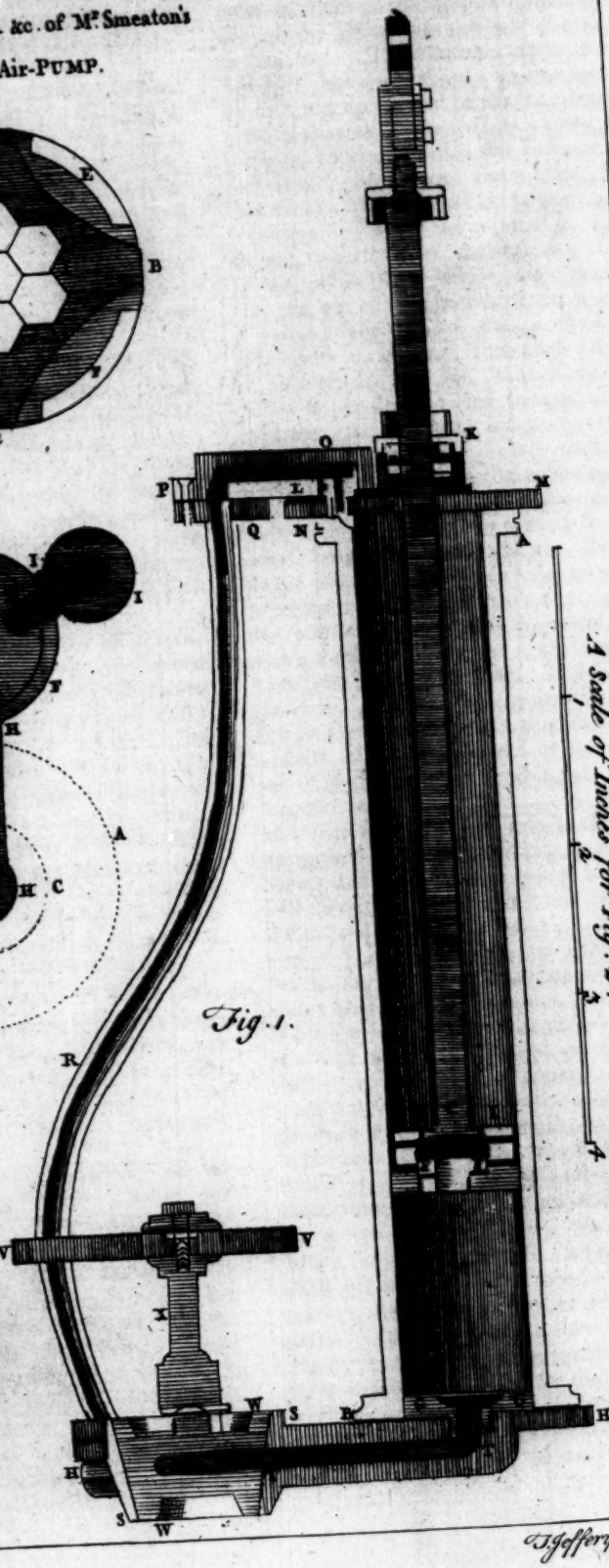
Mr. Smeaton has alſo improved upon the gages, commonly uſed for meaſuring the expanſion of the air; which his gage will do with certainty, to much leſs than the 1000th part of the whole. It conſiſts of a bulb of glaſs, ſomething in the ſhape of a pear, and ſufficient to hold about half a pound of quick ſilver. It is open at one end, and at the other end is a tube hermetically cloſed at top. By the help of a nice pair of ſcales, he found what proportion of weight a column of mercury of a certain length, contained in the tube, bore to that which filled the whole veſſel; and, by theſe means, was enabled to mark diviſions upon the tube, anſwering to the $\frac{1}{1000}$th part of the whole capacity; which being about $\frac{1}{10}$th of an inch each, may, by eſtimation, be eaſily ſubdivided into leſſer parts. This gage, during the exhauſting of the receiver, is ſuſpended therein by a ſlip wire; and when the pump is worked as much as ſhall be thought neceſſary, the gage is puſhed down, till the open end is immerged in a ciſtern

BRITISH MUSEUM

A Section &c. of Mr. Smeaton's Air-Pump.







T. Jefferys sculp

ciſtern of quick-ſilver, placed underneath: the air being then let in, the quick-ſilver will be driven into the gage, till the air remaining in it becomes of the ſame denſity with the external air; and as the air always takes the higheſt place, the tube being uppermoſt, the expanſion will be determined by the number of diviſions occupied by the air at top.

He has alſo endeavoured to render the pneumatic apparatus more ſimple and commodious, by making the air-pump act as a condenſing engine at pleaſure, by only turning a cock: this renders the pump an univerſal engine for ſhewing any effect, that ariſes from an alteration in the denſity or ſpring of the air; and with a little addition of apparatus, it ſhews the experiments of the air-fountain, wind-gun, *&c.* This is done in the following manner: the air above the piſton being forcibly driven out of the barrel at each ſtroke, and having no where to eſcape but by the valve at top; if this valve be connected with the receiver, by means of a pipe, and at the ſame time the valve at the bottom, inſtead of communicating with the receiver, be made to communicate with the external air, the pump will then perform as a condenſer. The mechaniſm is thus ordered: there is a cock with three pipes placed round it, at equal diſtances. The key is ſo pierced, that any two may be made to communicate, while the other is left open to the external air. One of theſe pipes goes to the valve at the bottom of the barrel; another goes to the valve at the top; and a third goes to the receiver. Thus, when the pipe from the receiver, and that from the bottom of the barrel, are united, the pump exhauſts: but turn the cock round, till the pipe from the receiver, and that from the top of the barrel communicate, and it then condenſes. The third pipe in one caſe, diſcharges the air taken from the receiver into the barrel; and, in the other, lets it into the barrel, that it may be forced into the receiver.

But the following figures will ſerve to render the ſtructure and uſe of this excellent machine ſtill more plain. Plate CCXIX. fig. 2. is a perſpective view of the ſeveral parts of the pump together. A is the barrel; B the ciſtern, in which are included the cock, with ſeveral joints: theſe are covered with water, to keep them air-tight. A little cock to let the water out of the ciſtern, is marked *b*. C *c c* is the triangular handle of the key of the cock; which, by the marks on its arms, ſhews how it muſt be turned, that the pump may produce the effect deſired. D H is the pipe of communication between the cock and the receiver; E is the pipe, that communicates between the cock and the valve, on the upper plate of the barrel. F is the upper plate of the pump, which contains the collar of leathers *d*; and V, the valve, which is covered by the piece *f*. G I is the ſiphon gage, which ſcrews on and off, and is adapted to common purpoſes. It conſiſts of a glaſs-tube hermetically ſealed at *c*, and furniſhed with quick-ſilver in each leg; which, before the pump begins to work, lies level in the line *a b*; the ſpace *b c* being filled with air of the common denſity. When the pump exhauſts, the air in *b c* expands, and the quick-ſilver in the oppoſite leg riſes, till it become a counter-ballance to it. Its riſe is ſhewn upon the ſcale I *e*, by which the expanſion of the air in the receiver may be nearly judged of. When the pump condenſes, the quick-ſilver riſes in the other leg, and the degree may be nearly judged of by the contraction of the air in *b c*; marks being placed at $\frac{1}{2}$ and $\frac{1}{3}$ of the length of *b c* from *c*, which ſhews when the receiver condenſes double or treble its common quantity. K L is a ſcrew-frame to hold down the receiver, in condenſing experiments, which takes off at pleaſure; and is ſufficient to hold down a receiver, the diameter of whoſe baſe is 7 inches, when charged with a treble atmoſphere: in which caſe it acts with a force of about 1200 pounds againſt the ſcrew-frame. M is a ſcrew, that faſtens a bolt, which ſlides up and down in that leg, by means whereof the machine is made to ſtand faſt on uneven ground.

Fig. 1. plate CCXX. repreſents a perpendicular ſection of the barrel and cock, *&c.* of the pump; where A B is the barrel, C D the rod of the piſton, which paſſes through M N, the plate that cloſes the top of the barrel. K is the collar of leathers, through which the piſton-rod paſſes. When the piſton is at the bottom of the cylinder, the upper part of K is covered by the cap at D, to keep out duſt, *&c.* L is the valve on the upper plate, which is covered by the piece O P, which is connected with the pipe Q R, which makes the communication between the

valve and cock. CE is the piſton, and EFF the piſton-valves. II are two little holes to let the air paſs from the piſton-valves into the upper part of the barrel. GG is the principal valve at the bottom of the cylinder. HH is a piece of metal, into which the valve GG is ſcrewed, and cloſes the bottom of the cylinder; out of which is alſo compoſed SS the cock, and KTT the duct from the cock to the bottom of the barrel. WW is the key of the cock. X the ſtem, and VV the handle.

Fig. 2. *ibid.* is an horizontal ſection of the cock, through the middle of the duct TT. AB repreſents the bigneſs of the circular plate, that cloſes the bottom of the barrel, and CD the bigneſs of the inſide of the barrel. EFG is the body of the cock; the outward ſhell being pierced with three holes at equal diſtances, and correſponding to the three ducts HH, II, KK, whereof HH is the duct that goes to the bottom of the barrel; II, the duct that communicates with the top of the barrel; and KK, the duct that paſſes from the cock to the receiver. LMN is the key, or ſolid part of the cock, moveable round in the ſhell EFG. When the canal LM anſwers to the ducts HH and KK, the pump exhauſts, and the air is diſcharged by the perforation N. But the key LMN being turned till the canal LM anſwers to the ducts II and KK, the perforation N will then anſwer to the duct HH, and in this caſe the pump condenſes. Laſtly, when N anſwers to KK, the air is then left in or diſcharged from the receiver, as the circumſtance requires.

Fig. 3. *ibid.* is the plan of the principal valve; where ABCD repreſents the bladder faſtened in four places, and ſtretched over the ſeven holes IK, formed into an hexagonal grating, which Mr. Smeaton chooſes to call the honey-comb. EFGH, ſhews where the metal is a little protuberant, to hinder the piſton from ſtriking againſt the bladder.

Fig. 4. *ibid.* repreſents the new gage, called from its ſhape the pear-gage, which is open at A. BC is the graduated tube, which is hermetically cloſed at C, and is ſuſpended by the piece of braſs DE; which is hollowed into a cylinder, and claſps the tube.

PUN, or PUNN, a conceit ariſing from the uſe of two words that agree in ſound, but differ in the ſenſe. Ariſtotle deſcribes two or three kinds of puns among the beauties of good writing, and produces inſtances of them out of ſome of the greateſt authors in the greek tongue. Cicero has ſprinkled ſeveral of his works with puns; and in his book, where he lays down the rules of oratory, quotes abundance of ſayings, which he calls pieces of wit, that upon examination prove perfect puns.

Puns, when they come eaſily, and are very ingenious, poignant and appoſite, are allowed of in converſation, letters, epigrams, madrigals, mottos, devices, *&c.* but are abſolutely baniſhed out of the grave, ſerious, and ſublime, by reaſon they weaken its force, and diminiſh its beauty, which conſiſts in ſomething great and elevated.

PUNA ISLE, an iſland of South-America, ſituated in the pacific Ocean, at the entrance of the bay of Guiaquil, in weſt long. 80°, ſouth. lat. 3° 15'.

PUNCH, an inſtrument of iron or ſteel, uſed in ſeveral arts, for the piercing or ſtamping holes in plates of metals, *&c.* being ſo contrived as not only to perforate, but to cut out and take away the piece. The punch is a principal inſtrument of the metal-button-makers, wafer-makers, patch-makers, ſhoe-makers, *&c.* See BUTTON-*making*, *&c.*

PUNCH HORSE, in the manege, is a well ſet, well knit, horſe, ſhort backed and thick ſhouldered, with a broad neck, and well lined with fleſh.

PUNCH is alſo a name for a ſort of compound drink, much uſed here, and in many parts abroad, particularly in Jamaica, and ſeveral other parts of the Weſt-Indies.

Its baſis is ſpring-water, which being rendered cooler, briſker, and more acid, with lemon-juice, and ſweetened again to the palate with fine ſugar, makes what they call ſherbet; to which a proper quantity of ſpirituous liquor, as brandy, rum, or arrack, being added, the liquor commences punch: the proportion of the ingredients are various; ſome, inſtead of lemon-juice, uſe lime-juice, which makes what they call punch-royal; this is found leſs liable to affect the head, and is more grateful to the ſtomach: ſome alſo make milk-punch, by adding as much milk to the ſherbet as there is water: others uſe green tea inſtead of water: and what is called chambermaid's punch is made without any water, of lime-juice, twice as much white-

white-wine as lime-juice, and four times as much brandy with ſugar.

Several authors condemn the uſe of punch as prejudicial to the brain and nervous ſyſtem.

PUNCHEON, PUNCHIN, or PUNCHION, a little block or piece of ſteel, on one end whereof is ſome figure, letter, or mark, engraven either in creux or relievo, impreſſions whereof are taken on metal, or ſome other matter, by ſtriking it with a hammer on the end not engraved. There are various kinds of theſe puncheons uſed in the mechanical arts; ſuch for inſtance are thoſe of the goldſmiths, cutlers, pewterers, *&c.*

The puncheon, in coining, is a piece of iron ſteeled, whereon the engraver has cut in relievo the ſeveral figures, arms, effigy, inſcription, *&c.* that are to be in the matrices, wherewith the ſpecies are to be marked. Minters diſtinguiſh three kinds of puncheons, according to the three kinds of matrices to be made; that of the effigy, that of the croſs or arms, and that of the legend, or inſcription. The firſt includes the whole portrait in relievo: the ſecond are ſmall, each only containing a piece of the croſs or arms; for inſtance, a fleur-de-lys, an harp, a coronet, *&c.* by the aſſemblage of all which the intire matrice is formed. The puncheons of the legend only contain each one letter, and ſerve equally for the legend on the effigy ſide and the croſs ſide. See the article COINING.

For the manner of engraving, tempering, and ſtamping theſe puncheons, to form the matrices, ſee the articles ENGRAVING, MATRICE, *&c.*

For the puncheons uſed in ſtamping the matrices wherein the types of printing characters are caſt, ſee *Letter* FOUNDERY.

PUNCHEON is alſo uſed for ſeveral iron-tools of various ſizes and figures, uſed by the engravers in creux on metals. Seal-gravers particularly uſe a great number for the ſeveral pieces of arms, *&c.* to be engraven, and many ſtamp the whole ſeal from a ſingle puncheon.

PUNCHEON is alſo a common name for all thoſe iron inſtruments uſed by ſtone-cutters, ſculptors, blackſmiths, *&c.* for the cutting, inciding, or piercing their ſeveral matters.

Thoſe of ſculptors and ſtatuaries ſerve for the repairing of ſtatues when taken out of the moulds; the lockſmiths uſe the greateſt variety of puncheons; ſome for piercing hot, others for piercing cold; ſome flat, ſome ſquare, ſome round, others oval, each to pierce holes of its reſpective figure in the ſeveral parts of locks.

PUNCHEON, in carpentry, is a piece of timber placed upright between two poſts, whoſe bearing is too great, ſerving, together with them, to ſuſtain ſome large weights.

This term is alſo uſed for a piece of timber raiſed upright, under the ridge of a building, wherein the little forces, *&c.* are jointed.

PUNCHEON is alſo uſed for the arbor, or principal part of a machine, whereon it turns vertically, as that of a crane, *&c.*

PUNCHEON is alſo a meaſure for liquids, containing an hogſhead and one third, or eighty-four gallons.

PUNCTA LACRYMALIA. See the article LACRYMAL.

PUNCTATED HYPERBOLA, an hyperbola whoſe oval conjugate is infinitely ſmall, *i. e.* a point. See HYPERBOLA.

PUNCTION, in ſurgery, the ſame with puncture. See PUNCTURE.

PUNCTUATION, in grammar, the art of pointing or of dividing a diſcourſe into periods, by points, expreſſing the pauſes to be made in the reading thereof. See the article POINT.

PUNCTUM, in geometry, *&c.* See the article POINT.

The punctum formatum, or generatum, in conics, is a point determined by the interſection of a right line drawn through the vertex of a cone to a point in the plane of the baſe that conſtitutes the conic ſection. See the articles CONE and CONIC SECTIONS.

The punctum ex comparatione denotes either of the foci of an ellipſis and hyperbola, thus called by Apollonius, becauſe the rectangles under the ſegment of the tranſverſe diameter in the ellipſis, and under that and the diſtance between the vertex and the focus in the hyperbola, are equal to one fourth part of what he calls the figure thereof. See FOCUS, ELLIPSIS, and HYPERBOLA.

The punctum lineans, is a term uſed by ſome authors for that point of the generating circle of a cycloid, or epicycloidal line. See the article CYCLOID.

PUNCTUM SALIENS, in anatomy, the firſt rudiments of the heart in the formation of the fœtus, where a throbbing motion is perceived. This is ſaid to be eaſily obſerved with a microſcope in a brood egg, wherein, after conception,

we

we ſee a little ſpeck or cloud, in the middle whereof is a ſpot that appears to beat or leap a conſiderable time before the fœtus is formed for hatching. See the article FOETUS.

PUNCTURE, in ſurgery, any wound made by a ſharp pointed inſtrument.

The puncture upon the external parts, and not penetrating deep, is reckoned the moſt ſimple wound. In this, after the blood has been ſtopped at the firſt dreſſing, by the application of dry lint, the common digeſtive, or balſamum Arcæi is to be ſpread upon a pledgit, and applied once every day; or if the diſcharge is but ſmall, every other day, covering the dreſſing with a plaſter and compreſs, and ſecuring the whole with a proper bandage: the firſt dreſſings that are applied, eſpecially where there has been a flux of blood, ſhould by no means be removed forcibly, but be left till they fall off of themſelves, which they will do when the ſuppuration is formed. But when a puncture penetrates very deep, the cure is attended with many difficulties, eſpecially if it is made perpendicularly down, and has no depending orifice; for in this caſe the blood and matter are eaſily collected at the bottom, and protract the cure, and frequently form fiſtulæ. To prevent theſe conſequences it will be proper to preſs the wound from the bottom upwards, and to apply a compreſs towards the fundus of the wound externally, and what is called the expelling bandage over all, as it preſſes much lighter upon the lower than the upper parts: but if all this precaution ſhould prove of no effect, it will be adviſeable to make a large opening at the bottom of the wound, before any fiſtulæ are formed, by a probe, in which caſe great care muſt be taken that the orifices are not healed before the bottom of the wound; this is to be effected by a ſhort, ſoft tent, which, when the wound is healed at the bottom, may be removed, and the orifices healed. How wounds of this kind are to be treated, which penetrate into the cavity of the thorax, or abdomen, may be ſeen under ABDOMEN, THORAX, GASTRORAPHY, &c.

PUNICA, the POMEGRANATE-TREE, in botany, a genus of the icoſandria-monogynia claſs of plants, the corolla whereof conſiſts of five roundiſh, erect, patent petals, inſerted into the calyx: the fruit is a large globoſe apple, coronated with the calyx, and formed into nine cells; the ſeeds are numerous and ſucculent: the receptacle is membranaceous, and divides every cell of the fruit into two parts. The flowers of the pomegranate, and the bark of the fruit, are ſtrongly aſtringent.

PUNISHMENT, in law, the penalty which a perſon incurs on the breach or tranſgreſſion of any law.

The forms and manners of puniſhment are various in different ages and countries, and for various crimes, as treaſon, felony, adultery, parricide, &c. Among us the principal civil puniſhments are fines, impriſonments, the ſtocks, pillory, burning in the hand, whipping, ducking-ſtool, hanging, beheading, quartering, burning, tranſportation, &c. The eccleſiaſtical puniſhments are cenſures, ſuſpenſions, deprivations, degradations, excommunications, anathemas, penances, &c. The military puniſhments are being ſhot, running the gantelope, riding the wooden horſe, &c.

PUNITORY INTEREST, in the civil law, ſuch intereſt of money as is due for the delay of payment, breach of promiſe, &c.

PUPIL, *pupillus*, in the civil law, a boy or girl not yet arrived at the age of puberty, *i. e.* the boy under fourteen years, the girl under twelve. While a minor remained under the direction of a tutor, he was called a pupil; after puberty, a curator being aſſigned him, he ceaſed to be called a pupil. A tutor is obliged to pay intereſt for what monies of his pupil lie idle and unemployed; and is allowed to do any thing for his pupil, but nothing againſt him. See the article TUTOR.

PUPIL is alſo uſed in univerſities, &c. for a youth under the education or diſcipline of any perſon.

PUPIL, *pupilla*, in anatomy, a little aperture in the middle of the uvea and iris of the eye, through which the rays of light paſs to the cryſtalline, in order to be painted on the retina, and cauſe viſion. See the articles EYE, IRIS, and UVEA.

The ſtructure of the uvea and iris, is ſuch as that by their aperture the pupil is contractible and dilatible at pleaſure, ſo as to accommodate itſelf to objects, and to admit more or fewer rays, as the object, being either more vivid and near, or more obſcure and remote, requires more or leſs light: it being a conſtant law, that the more luminous the object is, the ſmaller the pupil; and again, the nearer the object, the ſmaller the pupil; and *vice verſa*. This alteration of the pupil

pupil is effected by certain muſcular fibres on the outſide of the uvea, which arrive from the nerves detached hither from the ſclerotica: ſome others attribute the motion of the pupil to the ligamentum ciliare; and others think that both this and the fibres of the uvea concur herein.

There is a diſeaſe of the eyes called a contraction of the pupil, wherein there is ſuch a total or cloſe contraction of that part, that it will not tranſmit light enough to the bottom of the eye, to enable the patient to ſee objects diſtinct; ſometimes this diſorder is from infancy, and ſometimes it ariſes from an intenſe inflammation of the eye. The cure of this is extremely difficult; but Mr. Cheſelden has invented a method by which he has often proved very ſucceſsful in his attempts to relieve it. The method is this: the eye-lids being held open by a ſpeculum oculi, he takes a narrow, ſingle edged ſcalpel, or needle, almoſt like that uſed in couching for the cataract, and paſſing it through the ſclerotica, as in couching, he afterwards thruſts it forewards through the uvea, or iris, and in extracting cuts it open through the iris. See the article COUCHING.

PURA ELEMOSYNA, PURE ALMS, denotes a tenure whereby the churchmen hold lands in Scotland, ſomewhat on the footing of the primitive clergy.

PURBECK ISLE, the ſouth-eaſt diviſion of the county of Dorſet.

PURCHASE, in law, the buying or acquiring of lands, &c. with money, by deed or agreement, and not by deſcent or right of inheritance.

A joint purchaſe is when two or more perſons join together in the purchaſe. Purchaſers of lands are to take notice of all charges thereon: there are, however, certain ſtatutes to guard againſt fraudulent incumbrances. The court of Chancery will relieve the purchaſer of a term againſt a title that lay dormant where money has been laid out on improvements.

PURCHASE, in the ſea language, is the ſame as draw in: thus when they ſay the capſtan purchaſes a-pace, they only mean it draws in the cable a pace.

PURE, ſomething free from any admixture of foreign or heterogeneous matters: thus we ſay pure fire, &c. See the article FIRE, &c.

PURE HYPERBOLA, in conics, is an hyperbola without any oval, nodes, ſpike, or conjugate point. See CURVE.

PURFLEW, a term in heraldry, expreſſing ermins, peans, or any of the furs, when they compoſe a bordure round a coat of arms: thus they ſay, he beareth gules a bordure, purflew, vairy: meaning that the bordure is vairy.

PURGATION, the art of purging, ſcouring, or purifying a thing, by ſeparating, or carrying off any impurities found therein: thus,

In pharmacy, purgation is the cleanſing of a medicine by retrenching its ſuperfluities. In chemiſtry, it is uſed for the ſeveral preparations of metals and minerals intended to clear them of their impurities, more uſually called purification and refining. See REFINING.

In medicine, purgation is an excretory motion ariſing from a quick and orderly contraction of the fleſhy fibres of the ſtomach and inteſtines, whereby the chyle, corrupted humours, and excrements lodged therein, are protruded further and further, and at length quite excluded the body by ſtool. See the articles CATHARTICS and EVACUATION.

For the menſtrual purgations of women, ſee the article MENSES.

PURGATION, in law, ſignifies the clearing a perſon's ſelf of a crime of which he is ſuſpected and accuſed before a judge. This purgation is either canonical or vulgar. Canonical purgation is preſcribed by the canon-law, and the form thereof in the ſpiritual court is uſually thus: the perſon ſuſpected takes his oath that he is innocent of the crime charged againſt him; and at the ſame time brings ſome of his neighbours to make oath that they believe he ſwears truly. Vulgar purgation was antiently by fire or water, or elſe by combat, and was practiſed here till aboliſhed by our canons. See the article COMBAT, &c.

PURGATIVE, or PURGING MEDICINES, a medicament which evacuates the impurities of the body by ſtool, called alſo cathartics. See CATHARTICS.

We have had attempts of adjuſting the doſes of purgative medicines ſcientifically. Dr. Cockburn endeavoured at the ſolution of this problem, but, it is ſaid, on wrong principles. Dr. Balguy, in the Medical Eſſays of Edinburgh, has alſo given us an eſſay on this ſubject. He aſſumes, that part of the medicines is ſpent on the firſt paſſages, where it acts

as a ſtimulus; and that the other part is carried into the blood, and has its effects there by thinning and rarifying it. This being premiſed, 1. If the medicine acts only in the firſt paſſages, the doſe will be as the ſize of the perſon into the conſtitution. 2. If the whole medicine paſſes into the blood, the doſe will be as the ſize into the ſquare of the conſtitution; and, therefore, 3. You are to doſe ſo much of the medicine as is ſpent on the ſtomach and inteſtines directly as the conſtitution, and ſo much as is carried into the blood as the ſquare of the conſtitution; and the ſum into the perſon's ſize is the quantity required. The ſame rules hold in vomits. How far in either caſe the practice of phyſic may be thereby improved, we leave to the judgment of the learned. The ſolution of the problem ſuppoſes a great poſtulatum, no leſs than the art of meaſuring a perſon's conſtitution.

PURGATORY, a place in which the juſt who depart out of this life, are ſuppoſed to expiate certain offences which do not merit eternal damnation.

Broughton has endeavoured to prove, that this notion has been held by pagans, jews, and mahometans, as well as by chriſtians.

The doctrine of purgatory is a very lucrative article to the clergy of the romiſh church, who are very liberally paid for maſſes and prayers for the ſouls of the deceaſed. We are told by ſome of their doctors, that purgatory is a ſubterraneous place ſituated over the hell of the damned, where ſuch ſouls as have not yet made ſatisfaction to divine juſtice for their ſins, are purged by fire, after a wonderful and incomprehenſive manner; and here they are purified from thoſe dregs which hinder them from entering into their eternal country, as the catechiſm of the council of Trent expreſſes it.

PURGE, in medicine, the ſame with cathartics. See the article CATHARTICS.

PURIFICATION, in matters of religion, a ceremony which conſiſts in cleanſing any thing from a ſuppoſed pollution or defilement.

The pagans, before they ſacrificed, uſually bathed or waſhed themſelves in water, and they were particularly careful to waſh their hands, becauſe with theſe they were to touch the victims conſecrated to the gods. It was alſo cuſtomary to waſh the veſſel with which they made their libations. The mahometans uſe purifications as previous to the duty of prayer; theſe alſo are of two kinds, either bathing, or only waſhing the face, hands and feet. The firſt is requeſted only in extraordinary caſes, as after having lain with a woman, touched a dead body, &c. But leſt ſo neceſſary a preparation for their devotion ſhould be omitted, either where water cannot be had, or when it may be of prejudice to a perſon's health, they are allowed in ſuch caſes to make uſe of fine ſand, or duſt inſtead of it; and then they perform this duty by clapping their open hands on the ſand, and paſſing them over the parts, in the ſame manner as if they were dipped in water.

There were alſo many legal purifications among the Hebrews. When a woman was brought to bed of a male child, ſhe was eſteemed impure for forty days; and when of a female, for ſixty; at the end of which time ſhe carried a lamb to the door of the temple, to be offered for a burnt-offering, and a young pigeon or turtle for a ſin offering, and by this ceremony ſhe was cleanſed or purified. For other purifications of the Jews, ſee the article IMPURITY.

Among the romaniſts, the holy water is uſed by way of purification.

PURIFICATION *of the bleſſed Virgin*, a feſtival of the chriſtian church, obſerved on the ſecond of February, in memory of the purification of Chriſt in the temple, and his mother's ſubmitting to the jewiſh law of purification, after the birth of a male-child.

PURIFICATION, in chymiſtry, the act of purifying or refining natural bodies, by ſeparating the fæces and impurities from them. For the method of purifying metals, ſee the article REFINING, &c.

For the purification of ſemi-metals, ſee the articles ANTIMONY, SULPHUR, &c.

PURIM, or *the feaſt of lots*, a ſolemn feſtival of the Jews, inſtituted in memory of the deliverance they received from Haman's wicked attempt to deſtroy them, by means of Mordecai and Eſther.

PURITAN, a name formerly given in deriſion to the diſſenters from the church of England, on account of their profeſſing to follow the pure word of God, in oppoſition to all traditions and human conſtitutions. See the articles INDEPENDENTS, PRESBYTERIANS, &c.

PURLINS, in building, thoſe pieces of timber that lie acroſs the rafters on the inſide,

inſide, to keep them from ſinking in the middle of their length.

By the act of parliament for rebuilding of London, it is provided, that all purlins from fifteen feet ſix inches, to eighteen feet ſix inches long, be in their ſquare nine inches and eight inches; and all in length from eighteen feet ſix inches, to twenty-one feet ſix inches, be in their ſquare twelve inches and nine inches.

PURLUE, or PURLIEU, ſignifies all that ground near any foreſt, which being made foreſt by king Henry II. Richard I. and king John, was afterwards by perambulations and grants of Henry III. ſevered again from the ſame, and made purlieu; that is to ſay, pure and free from the laws of the foreſt.

The owners of grounds within purlieus, may convert paſture into arable, &c. as alſo incloſe them with any kind of incloſures, or erect edifices upon them, and may diſpoſe of the ſame as if they had never belonged to the foreſt. hence if the wild beaſts chance to wander out of the foreſt into the purlieu, the king has ſtill a property in them, againſt every man except the owner of the ground in which they are, who hath a ſpecial property in them *ratione ſoli*; yet ſo far as he may take them by hunting with his greyhounds or dogs, without any foreſtalling or foreſetting them in their courſe again towards the foreſt.

PURLUE-MAN, or PURLIEU-MAN, a perſon who has ground within the purlieu, and is qualified to hunt within the ſame, though under certain reſtrictions.

By a ſtatute of Car. II. no man may keep greyhounds within the purlieu, or elſewhere within England and Wales, unleſs he have a free warrant, or be lord of a manor, or ſuch a freehold as is ſeiſed in his own right, or in right of his wife, of lands, tenements, or hereditaments, of the clear yearly value of 40 l. over and above all the charges of repriſes of ſuch eſtate of inheritance; or of lands, tenements, &c. in his own right, or in the right of his wife, for the term of life or lives, of the yearly value of 80 l. over and above all charges and repriſes; or that is worth in goods or chattels 400 l. Others that are not thus qualified, and yet have land in the purlieus, if they find beaſts of the foreſt in their own ground, within the purlieu, may chaſe them out with little dogs, though not with greyhounds.

PURPLE, a colour compoſed of a mixture of red and blue.

A beautiful tranſparent purple for painting, may be made by boiling four ounces of raſped braſil-wood in a pint of ſtale beer, and half an ounce of logwood, till the liquor is heightened to the colour you deſire, which may be known by dipping a piece of paper in it. If you find it too red, add a quarter of an ounce more of logwood, which will render it ſtill deeper, and by this method you may bring it to any degree of purple, by putting in either more or leſs logwood to the former compoſition, and fixing it with alum. This will produce ſuch a clear purple, as no mixture of reds and blues will produce. Madam Mariana of Amſterdam, famous for painting in miniature, and for her excellent manner of illuminating prints, ſays, that the beſt purple that can be made, may be compoſed between the carmine and indigo; to ſtrengthen which, on the red ſide, you may add lake, between the lighter and darker part: and ſo like, when it is uſed in the ſame way, on the foregoing purple, produces a very fine effect.

To dye ſtuffs, &c. *a* PURPLE. Allow a ſufficient quantity of fair water to every pound of ſtuff, one pound of tartar, and two ounces of alum, in which boil the ſtuff for an hour; then take it out, cool and rinſe it; after this, warm ſome clean water, into which put three ounces of braſil-wood; boil it half an hour, and then work the ſtuffs in it, till they are as red as deſired: upon which take them out, and put into the dye two ounces of pot-aſhes; ſtir it well about; put in the ſtuff once more; roll it off and on the roller, that it do not ſpot; then cool, and rinſe it out.

To dye ſtuffs of a laſting purple. For this purpoſe the ſtuff, when white, ought to be very clean and free from ſpots and ſtains, that it may have the better luſtre when dyed. To give it the blue caſt, the ſtuff muſt be firſt dyed to the depth of a ſky-colour with wood or indigo, and then dried. To give it the deepening, boil half a pound of braſil, and divide it into four parts, and dye it time after time in each with the following mixture: To the firſt part of the braſil add one dram of ſaltpetre, and one dram of ſal armoniac powder; to the ſecond, add a quarter of an ounce of powdered galls, and half an ounce of Paris-red; to the third, a quarter of an ounce of galls,

and a quarter of an ounce of calcined tartar, and of alum and ſaltpetre, each a dram. The fourth time, add a quarter of an ounce of galls powdered, as much turmeric, and a quarter of ſharp lye, and you will have a beautiful colour.

To dye ſilk a ſlight purple, put it into the ſlighter red-dye; but increaſe the quantity of pot-aſhes, to turn it to purple; then rinſe and dry it.

To dye thread of a purple-colour, firſt alum the thread with three pounds of alum, half a pound of tartar, and two ounces of braſil; dry it, and draw it through the wood or indigo-dye; then rinſe it clean, and dry it again: to deepen it, take ten ounces of braſil, being firſt boiled, which liquor divide into three parts, to be uſed at three times. To the firſt add half an ounce of paris-red, one dram of maſtich, and a quarter of an ounce of calcined tartar; always drying the thread, after you have uſed every one of the parts of the liquor. The ſecond time, add half an ounce of turmeric, two drams of cinnabar, and half an ounce of gum-arabic. The third time, when the thread becomes reddiſh, add a quart of ſharp lye; and by this means the thread will obtain a laſting colour.

PURPLE FEVER, the ſame with miliary fever. See MILIARY FEVER.

PURPURA, in natural hiſtory, a genus of ſimple ſhells, having no hinge, formed of one continuous piece, and covered from the top to the bottom with ſpines, tubercles, and umbos: the mouth is ſmall, and approaches to a round figure: the clavicle is ſhort, but the other extremity is uſually protended to a conſiderable length.

To this genus belong, 1. The thorny woodcock ſhell, or yellow purpura, with long and ſomewhat crooked ſpines. (See plate CCXXI. fig. 1. n° 1.). 2. The common woodcock-ſhell, or variegated yellowiſh purpura, with tubercles, and a very long beak (*ibid.* n° 2.). 3. The endive-ſhell, or ſhort-beaked purpura, with ſix ſeries of laciniated ſpines (*ibid.* n° 3.). 4. The caltrop-ſhell, or ſhort-beaked purpura, with expanded ſpines, ranged in three ſeries (*ibid.* n° 4.)

There are a great many other ſpecies, diſtinguiſhed by the like peculiarities.

PURPURE, POURPRE, or PURPLE, in heraldry, according to ſome, is one of the five colours of armories, compounded of gules and azure, bordering on violet, and, according to others, of a great deal of red and a little black. But it was excluded by the antient heralds as only an imperfect colour. In the coats of noblemen it is called amethyſt; and in thoſe of princes, mercury. It is repreſented in engraving, by diagonal lines drawn from the ſiniſter chief to the dexter baſe point. See plate CCXVIII. fig. 4.

PURPURATI, in our antient hiſtorians, denotes the ſons of emperors and kings.

PURREL, a liſt ordained by act of parliament to be made at the end of kerſeys, to prevent deceit in diminiſhing their length.

PURSE, a manner of accounting, or a ſpecies of money of account, much uſed in the Levant. See the article MONEY.

PURSER, an officer aboard a man of war, who receives her victuals from the victualler, ſees that it be well ſtowed, and keeps an account of what he every day delivered to the ſteward. He alſo keeps a liſt of the ſhip's company, and ſets down exactly the day of each man's admiſſion, in order to regulate the quantity of proviſions to be delivered out, and that the paymaſter or treaſurer of the navy may iſſue out the diſburſements, and pay off the men, according to his book.

PURSIVENESS, among farriers, is a diſorder in horſes, otherwiſe called broken wind, in which the horſe makes a hiſſing whiſtling ſound in his throat, and has a greater heaving in the flanks than in common colds.

The cauſe of purſiveneſs proceeds from ſurfeiting, hard exerciſe upon a full belly, the horſe's being rid into water when he ſweats, and, laſtly, from obſtinate colds ill cured.

For the cure of this diſorder, Dr. Bracken adviſes, that the horſe ſhould have good nouriſhment, much corn but little hay, and that every other day the water given him be impregnated with half an ounce of ſaltpetre, and two drams of ſal armoniac.

PURSLAIN, *portulaca*, in botany, a genus of the polyandria-monogynia claſs of plants, the corolla whereof conſiſts of five plane, erect, obtuſe, emarginated petals, larger than the cup; the fruit is an oval, covered capſule, containing only one cell, and opening horizontally at the middle; the ſeeds are numerous, ſmall, and roundiſh.

This plant is cultivated in gardens for culinary uſes; the ſeeds are ranked among the leſſer cold ſeeds, and have ſometimes

ſometimes been employed in emulſions, and the like, along with others of that claſs.

PURSUIVANT, or POURSUIVANT. See the article POURSUIVANT.

PURVEYANCE and PURVEYOR. See the article POURVEYANCE.

PURVIEW, a term uſed by ſome lawyers for the body of an act of parliament, or that part which begins with, Be it enacted, &c. as contradiſtinguiſhed from the preamble.

PURULENT, in medicine, ſomething mixed with, or partaking of, pus or matter.

PUS, in medicine, a white or yellowiſh putrid matter, formed of corrupted blood, and contained in a wound or ulcer. See ABSCESS and SUPPURATION.

When pus is laudable and mild, it is one of the moſt powerful digeſters, ſuppurants, and incarners; when it ſtagnates too long, or when the liquors and veſſels are faulty, it may become an acrid, ſtimulating, eroding ſanies; when abſorbed in the blood, it affects all the liquors, ſtimulates the veſſels, and is capable of producing violent diſorders: for a very ſmall portion of pus abſorbed into the blood-veſſels, raiſes a putrid fever, as certainly as yeſt does a fermentation in wort.

PUSTULE, a pimple, or ſmall eruption on the ſkin full of pus; ſuch are the puſtules of the ſmall-pox and french-pox. See the article POX.

Puſtules principally break out in the ſpring, and are of various kinds; for ſometimes a kind of roughneſs ariſes all over the body, reſembling that which is produced by the application of a nettle; theſe are ſometimes red, and ſometimes they retain the natural colour of the ſkin. There are alſo puſtules of a livid, a pale, a black, or any other unnatural colour, with an humour contained in them; when they break, the ſubjacent fleſh frequently appears as if it was ulcerated.

Puſtules are ſometimes converted into ſmall ulcers, either moiſt or dry; ſometimes they are accompanied only with an itching, at other times with inflammation and pain; and a pus or ſanies, or both, are diſcharged.

In the cure of puſtules, the firſt ſtep to be taken is to uſe much exerciſe and walking; and if theſe cannot be practiſed, geſtation is the beſt ſuccedaneum. The ſecond ſtep is to diminiſh the quantity of aliments, and abſtain from all acrid and extenuating ſubſtances.

Ulcers formed from puſtules, are removed by litharge mixed with the ſeeds of fenugreek, adding oil of roſes and the juice of endive till they are of the conſiſtence of honey.

PUTANISM, whoredom, or the life or condition of a courteſan.

PUTLOGS, or PUTLOCKS, in building, a ſhort piece of timber about ſeven feet long, uſed in building ſcaffolds. They lie at right angles to the wall with one of their ends reſting upon it, and the other upon the poles which lie parallel to the ſide of the wall of the building.

PUTORIUS, the POLE-CAT, in zoology, the yellowiſh black muſtela, with a white mouth and yellow collar. See the article MUSTELA.

This creature is ſomewhat ſmaller than the Martin; the head is ſmall, oblong, pointed at the extremity, and rounded on the ſummit; the ears are ſhort, broad, patulous, and white at the edges; the eyes are large, black, and piercing in their aſpect; the mouth is wide, and well furniſhed with teeth; the neck is ſhort and thick; the body is long and ſlender; and the legs are ſhort, and not very robuſt.

PUTREFACTION, a kind of ſlow corruption produced by heat and ſome moiſt fluid, particularly the air and water; which, penetrating the pores, diſſolves and ſets at liberty ſome of the more ſubtile parts, particularly the ſalts and oils, and thus looſens the compages, and changes the texture of bodies. See the article CORRUPTION.

Putrefaction is one of the inſtruments of nature by which many great changes are brought about. If we take a quantity of freſh and green cabbage-leaves, ſays Dr. Shaw, and preſs them hard down with weights in an open tub bored full of holes on the ſides, and ſet in a warm place; by ſtanding in this ſtate for ſome days, the leaves conceive a heat in the middle, which ſpreads to the external parts, till at length nearly the whole is converted into a pappy ſubſtance reſembling putrified fleſh, which on being diſtilled in a glaſs-retort, affords the ſame kind of volatile ſalt and oil, as if it had been an animal ſubſtance. This experiment ſucceeds alike in all tender, juicy, vegetable ſubjects: ſo that both the acid and alkaline tribe of plants, the ſweet and the bitter, the aſtringent and emollient, &c. reſolve into the ſame pappy putrid ſubſtance.

Hence we ſee the way employed by nature for changing all vegetable into animal ſubſtances, or of reducing the matters of both kingdoms into a ſimilarity. Thus if any large animal body, as that of a horſe, or dog, for example, be expoſed in a dead ſtate to the open air and the ſummer's ſun, it in a few days begins to ſwell, purge, and emit a nauſeous ſtench: at length the carcaſe is deſtroyed by the commotion, and reſolved into a putrid, fetid, ſtercoraceous matter: a large part, in the mean time, flying off into the air, ſo as to leave but a ſmall proportion of a mucilaginous pappy ſubſtance, which ſoon grows dry, or turns to a kind of earth. This experiment is univerſal, and holds equally of birds, beaſts, and fiſhes. Whence rivers, the ocean, and the atmoſphere itſelf muſt be neceſſarily impregnated with fermenting, putrefying, and putrefied particles; which are mixed with other matters and diſperſed through the immenſe bodies of thoſe fluids, in which they undergo ſuch changes, whether by uniting with the ſalts of the air and ocean, or otherwiſe, as not ordinarily to prove deſtructive or noxious to the creatures that inhabit thoſe elements. But by the very means by which bodies are diſſolved, and reduced to their firſt principles, they are ſtill kept in being. With regard to medicine, we know that neither animal nor vegetable ſubſtances can become aliment without undergoing ſome degree of putrefaction. Many diſtempers proceed from a deficiency of this action. The criſis of fevers ſeems to depend upon it, and even animal heat, according to Dr. Stevenſon, does the ſame.

Now that the concoction of the humours is nothing elſe but putrefaction, ſays Dr. Pringle, in his Obſervations on the diſeaſes of the army, ſeems probable from hence, that whenever they are in that ſtate, they are always more fluid, and fitter to paſs through the ſmaller veſſels, where they ſtagnated before. The offenſiveneſs of the ſweats, or other excretions conſequent on a criſis, is alſo a ſure ſign of a high degree of corruption. The time of reſolution or putrefaction depends on the degree of heat, the habit of the patient, and on the part obſtructed. Reſolution is the putrefaction of the empacted humour only, but ſuppuration implies a corruption of the veſſels alſo. This manner of ſpeaking, indeed, has been diſuſed, from the prejudices that nothing was putrid but what was offenſively ſo; whereas, in fact, every fibre becoming more tender, and humour thinner, may be conſidered as in ſome degree putrid, whether the change tends to the better health, or the deſtruction of the perſon, or whether it becomes grateful or offenſive to the ſenſes.

As all the humours of animal bodies become thinner by putrefaction, ſo the ſolid or fibrous parts are thereby relaxed and rendered more tender; and hence the extraordinary bulk of the heart, liver, and ſpleen, incident to perſons labouring under putrid diſeaſes, may be accounted for. It is remarkable, that in diſſections of people who die of the plague, the heart is almoſt always found of an uncommon bigneſs; and as to the ſcurvy, the liver and ſpleen are ſometimes enlarged to ſuch a degree, as to be ſeen outwardly.

Putrefaction is always found to generate air. Hence though fleſh as well as blood be ſpecifically heavier than water, yet dead bodies are found to float, after lying ſome time at the bottom, from air generated in the bowels by putrefaction.

The differences between putrefaction and fermentation, according to Boerhaave, are theſe: 1. A greater groſſneſs, compreſſion and denſity ſeems required in putrefaction, than in the fermentation of vegetables. 2. Putrefaction acts upon all vegetables whatſoever, provided they be ſoft and juicy; but fermentation only upon ſome, and not upon others. 3. The heat required in putrefaction, ſpontaneouſly riſes from the degree of an healthy human body, even to that of a violent flame; but in fermentation, if the degree of heat riſes up to that of an healthy body, the fermenting cauſe is diſſipated, and the liquor turned vapid; for the heat generated by fermentation is not greater than that of ſeventy five degrees, except in the fermentation of vinegar, and even there, unleſs the heat be immediately ſtopped, no vinegar, but a corrupt vapid liquor will be obtained. 4. Putrefaction renders all the ſaline matters volatile and alkaline, the oils fetid and volatile, and almoſt volatilizes the earth itſelf; but fermentation makes acids volatile and ſubtile, and contrary to alkalies, ſpirituous, gratefully odorous and inflammable; and it generates an acid tartar, that leaves an alkaline matter as fixed in the fire, as the ſubject would have done before. 5. The ſalts that

that by putrefaction are of the ſame ſimple, alkaline, fetid volatile nature, are by fermentation acid, in a great meaſure fixed, and compounded of ſpirit, oil and earth. And, 6. Putrefaction is a means of intirely converting all the ſaline vegetable matters into one and the ſame ſimple volatile alkali; but fermentation converts only a ſmall part of the ſaline matter of vegetables, into a liquid, volatile acid, leaving the reſt almoſt unchanged.

PUTRID, ſomething rotten, or putrified. See the article PUTREFACTION.

Thus a putrid fever, is a fever in which the humours, or part of them, are become putrefied, as in malignant fevers. See the article MALIGNANT.

PUTTOCKS, or PUTTOCK *ſhrouds*, in a ſhip, are ſmall ſhrouds which go from the ſhrouds of the main-maſt, fore-maſt, and mizen-maſt, to the top-maſt ſhrouds; and if there be any top-gallant maſts, there are puttocks to go from the top-maſt ſhrouds into theſe. Theſe puttocks are at the bottom ſeized to a ſtaff, or to ſome rope which is ſeized to a plate of iron, or to a dead man's eyes, to which the lanniards of the fore-maſt ſhrouds do come.

PUTTY, the ſame with ſpodium. See the article SPODIUM.

PUTTY, in its popular ſenſe, is a kind of paſte compounded of whiting and linſeed oil, beaten together to the conſiſtence of thick dough.

It is uſed by glaziers for the faſtening in the ſquares of glaſs in ſaſh-windows, and by painters for ſtopping up the crevices and clefts in timber and wainſcots, *&c.*

PUTTY, ſometimes alſo denotes the powder of calcined tin, uſed in poliſhing and giving the laſt gloſs to works of iron and ſteel.

PUTURA, a cuſtom claimed by the keepers of foreſts, and ſometimes by bailiffs of hundreds, to take man's meat, horſe's meat, and dog's meat, of the tenants and inhabitants gratis, within the perambulation of the foreſt, or liberty of the hundred.

The land ſubject to this cuſtom is called terra putura.

PYANEPSIA, in antiquity, an athenian feſtival celebrated on the ſeventh day of the month pyanepſion; which, according to the generality of critics, was the ſame as our ſeptember.

Plutarch refers the inſtitution of this feaſt to Theſeus, who after the funeral of his father, on this day paid his vows to Apollo, becauſe the youths who returned with him ſafe from Crete then made their entry into the city. On this occaſion theſe young men putting all that was left of their proviſions into one kettle, feaſted together on it, and made great rejoicing. Hence was derived the cuſtom of boiling pulſe on this feſtival. The Athenians likewiſe carried about an olive branch, bound about with wool, and crowned with all ſorts of firſt fruits, to ſignify that ſcarcity and barrenneſs were ceaſed, ſinging in proceſſion a ſong. And when the ſolemnity was over, it was uſual to erect the olive-branch before their doors, as a preſervative againſt ſcarcity and want.

PYCNOSTYLE, in the antient architecture, is a building where the columns ſtand very cloſe to each other; only one diameter and a half of the column being allowed for the intercolumniations.

According to Mr. Evelyn, the pycnoſtyle chiefly belonged to the compoſite order, and was uſed in the moſt magnificent buildings; as at preſent in the periſtyle at St. Peter's at Rome, which conſiſts of near three hundred columns; and in ſuch as yet remain of the antients, among the late diſcovered ruins of Palmyra.

PYCNOTICS, the ſame with incraſſants. See the article INCRASSATING.

PYE, or SEA-PYE, *hæmatopus*. See the article HÆMATOPUS.

PYGARGUS, in ornithology, the falco with a yellow cera, and with the tail-feathers white and black at the end. See the article FALCO.

PYGME, the ſame with cubit. See the article CUBIT.

PYGMY, a perſon not exceeding a cubit in height.

This appellation is given by the antients to a fabulous nation ſaid to have inhabited Thrace; who brought forth young at five years of age, and were old at eight; theſe were famous for the bloody war they waged with the cranes.

PYLORUS, in anatomy, the right or lower orifice of the ſtomach, which is connected with and opens into the inteſtines. See the articles STOMACH and INTESTINES.

PYONY, or PIONY. See PIONY.

PYRAMID, πυραμις, in geometry, a ſolid ſtanding on a triangular, ſquare, or polygonal baſis, and terminating in a point at the top; or, according to Euclid, it is a ſolid figure, conſiſting of ſeveral

veral triangles, whoſe baſes are all in the ſame plane and have one common vertex. See plate CCXXI. fig. 2. n° 1, 2, 3.

Hence the ſuperficies of a given pyramid is eaſily found by meaſuring theſe triangles ſeparately; for their ſum added to the area of the baſe, is the ſurface of the pyramid required.

It is no leſs eaſy to find the ſolid content of a given pyramid; for the area of the baſe being found, let it be multiplied by the third part of the height of the pyramid, or the third part of the baſe by the height, and the product will give the ſolid content, as is demonſtrated by Euclid, lib. 12. prop. 7.

If the ſolid content of a fruſtum of a pyramid is required, firſt let the ſolid content of the whole pyramid be found; from which ſubſtract the ſolid content of the part that is wanting, and the ſolid content of the fruſtum, or broken pyramid, will remain. See FRUSTUM.

Every pyramid is equal to one third of its circumſcribing priſm, or that has the ſame baſe and height; that is, the ſolid content of the priſm A B D (*ibid.* n° 2.) is equal to one third of the priſm A B F E. For ſuppoſing the baſe A *a* B *b* a ſquare, then does the pyramid conſiſt of an infinite number of ſuch ſquares, whoſe ſides or roots are continually increaſing in arithmetical progreſſion, beginning at the vertex or point D; its baſe, A *a* B *b*, being the greateſt term, and its perpendicular height, C D, the number of all the terms: but the laſt term multiplied into the number of terms will be triple the ſum of all the ſeries, or $\frac{NLL}{3} = S$ = the ſolid content of the pyramid.

All pyramids are in a ratio compounded of their baſes and altitudes; ſo that, if their baſes be equal, they are in proportion to their altitudes; and vice verſa.

Equal pyramids reciprocate their baſes and altitudes; that is, the altitude of one is to that of the other, as the baſe of the one is to that of the other.

PYRAMID, in architecture, a ſolid maſſive building, which from a ſquare, triangular, or other baſe, riſes diminiſhing to a vertex or point.

Pyramids are ſometimes uſed to preſerve the memory of ſingular events; and ſometimes to tranſmit to poſterity the glory and magnificence of princes. But as they are eſteemed a ſymbol of immortality, they are moſt commonly uſed as funeral monuments. Such is that of Ceſtius at Rome, and thoſe other celebrated ones of Egypt, as famous for the enormity of their ſize, as their antiquity. Theſe are ſituated on the weſt ſide of the Nile almoſt oppoſite to Grand Cairo; the baſe of the largeſt covers more than ten acres of ground, and is, according to ſome, near ſeven hundred feet high, tho' others make it but ſix hundred, and ſome but little more than five hundred. The pyramid is ſaid to have been, among the Egyptians, a ſymbol of human life; the beginning of which is repreſented by the baſe, and the end, by the apex; on which account it was, that they uſed to erect them over ſepulchres.

PYRAMIDAL, ſomething relating to a pyramid. See the preceding article.

PYRAMIDAL NUMBERS. See NUMBER.

PYRAMIDALES *papillæ*. See the article PAPILLA.

PYRAMIDALIA CORPORA, in anatomy, the two protuberances of the medulla oblongata. The ſpermatic veſſels are alſo by ſome authors thus termed.

PYRAMIDALIS, in anatomy, a ſmall muſcle in the abdomen lying in the lower part of the rectus. It has its name from its figure, and its origin from the margin of the os pubis, with a broad fleſhy head, whence it grows gradually narrower, till it ends in a ſmall round tendon in the linea alba, ſometimes almoſt at the navel. This muſcle is ſometimes ſingle, ſometimes it has its fellow, and in ſome ſubjects they are both wanting.

Pyramidalis is alſo the name of one of the dilatores, or muſcles which ſerve to turn up the noſe. This muſcle riſes at the foot of the noſe, and is uſually continuous with the frontalis. It deſcends along the ſide of the noſe, where it is by degrees a little expanded. It is inſerted into the alæ of the noſe, and often ſends down its fibres as far as to the upper-lip.

PYRAMIDOID, the ſame with the parabolic ſpindle. See the article PARABOLIC.

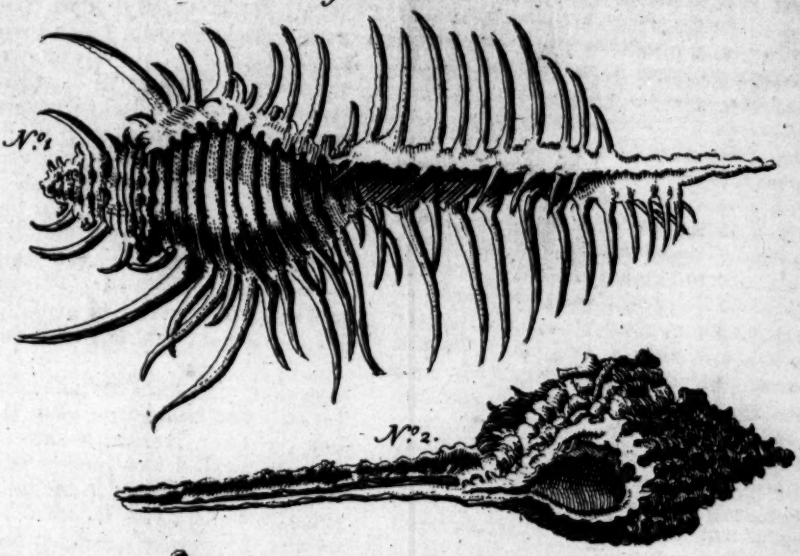
PYRATE. See the article PIRATE.

PYRENEAN MOUNTAINS divide France from Spain, and are not inferior to the Alps in height: they extend from the Mediterranean to the ocean, upwards of two hundred miles in length; the greateſt breadth being about one hundred and twenty.

PYRENOIDES PROCESSUS, in anatomy, a proceſs of the ſecond vertebra of the neck, called alſo odontoides, and dentiformis.

PYRETHRUM, in the materia medica,

Fig. 1. PURPURA.



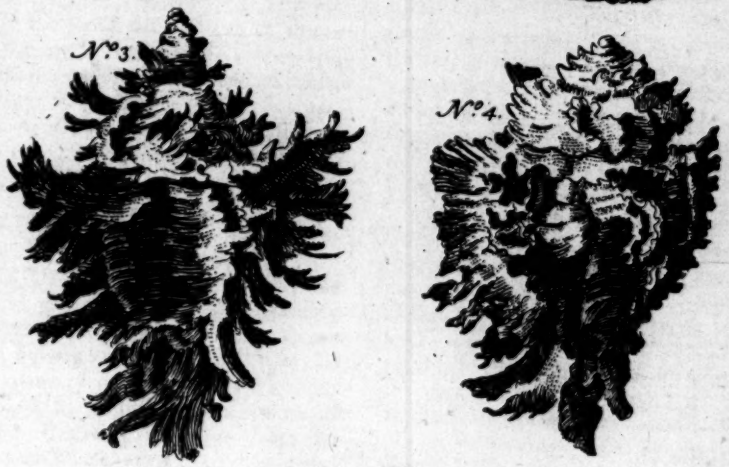
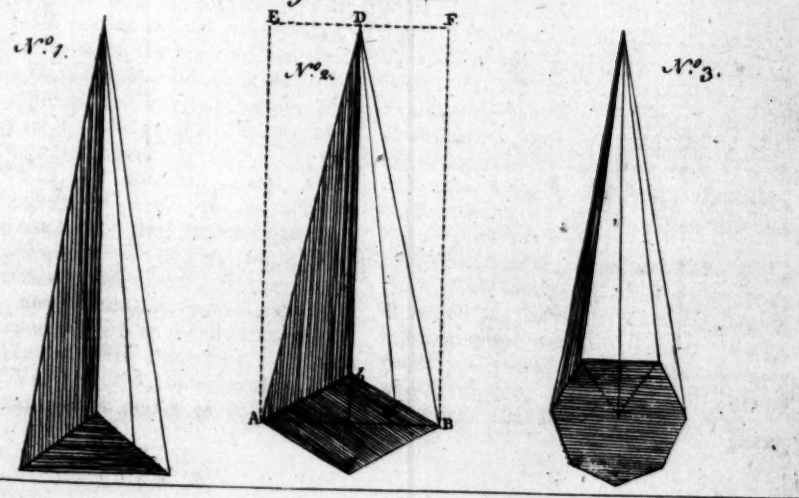


Fig. 2. PYRAMID.



J. Jeffreys sculp.

BRITISH MUSEUM

the root of a ſpecies of the buphthalmum, called, among us, pellitory of Spain. See the article BUPHTHALMUM.

The pyrethrum is a ſmall and firm root, about two or three inches in length, and from a quarter of an inch to a little more in diameter; its ſurface is very much corrugated; it is of a duſky brown colour on the outſide, and appears whitiſh within. It is to be choſen in the largeſt and perfecteſt pieces, ſound and firm, and not brittle nor duſty. The eaſtern nations uſe a great deal of this root, and ſend it to Cairo, Conſtantinople, and other places, where it is eſteemed an excellent medicine in colics and diſeaſes of the breaſt.

There is another kind of pyrethrum which is more uncommon here than the former: this is ſmaller, ſlenderer, and of a paler colour, and is the root of a ſpecies of the Chryſanthemum. Pyrethrum of either of theſe kinds is violently acrid and pungent, whence it is of great ſervice in the tooth ach, and other diſorders of the head. It vellicates the nerves, and aſſiſts in opening their obſtructions, and hence is given in ſleepy diſeaſes, apoplexies, lethargies, and in palſies of the tongue. It is ſometimes added to clyſters given in apoplectic and lethargic caſes.

PYRETICS, medicines good againſt fevers. See FEVER and FEBRIFUGE.

PYRICUBIUM, in natural hiſtory, the name of a genus of foſſil bodies, uſually comprehended, with many others of very different figures and ſtructures, under the general name of pyrites. See PYRITES.

PYRIFORMIS, in anatomy, a muſcle of the thigh, receiving its name from its figure, which reſembles that of a pear. It riſes thick from the lower part of the os ſacrum, where it is joined to the ileum; from thence it runs tranſverſely towards the joint of the hip, and terminates in a ſhort tendon, which is inſerted in the middle of the internal labium of the upper edge of the great trochanter, by two or three branches.

PYRIPLACIS, in natural hiſtory, the name of a genus of pyrites, the characters of which are theſe: they are compound, inflammable, metallic bodies, found in looſe detached maſſes, of a ſimple and uniform, not ſtriated, internal ſtructure, and are covered with an inveſtient coat or cruſt. See the article PYRITES.

PYRIPOLYGONIUM, in natural hiſtory, the name of a genus of foſſils, the characters of which are, that they are compound, metallic bodies, of a regular figure, conſiſting of twelve planes.

There is only one known ſpecies of this genus, tho' ſubject to great varieties in its appearance; and this has been by authors hitherto confounded, with many other bodies of a very different nature and figure, under the general name pyrites.

PYRITES, or PYRITÆ, in natural hiſtory, a name uſed for a claſs of compound inflammable metallic bodies found in detached maſſes, but of no determinately angular figure. This claſs Doctor Hill divides into two orders, the firſt of which, being thoſe pyritæ of a plain and ſimple internal ſtructure, comprehends two genera: the firſt genus, termed pyriplaces, are thoſe pyritæ of a ſimple internal ſtructure, and covered with an inveſtient coat or cruſt; the ſecond genus, termed gymnopyres, are thoſe pyritæ of a ſimple internal ſtructure, and not covered with a cruſt; the ſecond order being thoſe pyritæ of a regularly ſtriated internal ſtructure alſo comprehends two genera, the firſt termed pyritricha are thoſe pyritæ of a ſimple ſtriated texture; the ſecond genus called pyritrichiphylla are thoſe pyritæ whoſe ſtriæ terminate in foliaceous ends.

This foſſile is recommended by ſome authors as an emmenagogue, but it is ſcarce ever preſcribed with this intention; the common green vitriol, or copperas of the ſhops, is made from it; and an acid ſomewhat different from that of pure vitriol may be drawn off from it by the retort, after it has been expoſed to the air till it moulders away: this is of great uſe in mineralogy, and is a ſolvent for ſeveral foſſils that none of the other acids will touch. See the article VITRIOL.

PYRITRICHIPHYLLUM, in natural hiſtory, the name of a genus of foſſils of the claſs of the pyrites, the characters of which are theſe: they are compound, inflammable, metallic bodies, found in looſe maſſes, not of any regularly angular figure, and of a ſtriated texture, with foliaceous ends to the ſtriæ, appearing on the ſurface or within the maſs. See the article PYRITES.

PYRITRICHUM, in natural hiſtory, the name of a genus of pyrites, the characters of which are theſe: they are compound, inflammable, metallic foſſils, always found in detached maſſes of no regularly angular figure, and of a ſimple ſtriated ſtructure. See the article PYRITES.

BRITISH MUSEUM

the root of a ſpecies of the buphthalmum, called, among us, pellitory of Spain. See the article BUPHTHALMUM.

The pyrethrum is a ſmall and firm root, about two or three inches in length, and from a quarter of an inch to a little more in diameter; its ſurface is very much corrugated; it is of a duſky brown colour on the outſide, and appears whitiſh within. It is to be choſen in the largeſt and perfecteſt pieces, ſound and firm, and not brittle nor duſty. The eaſtern nations uſe a great deal of this root, and ſend it to Cairo, Conſtantinople, and other places, where it is eſteemed an excellent medicine in colics and diſeaſes of the breaſt.

There is another kind of pyrethrum which is more uncommon here than the former: this is ſmaller, ſlenderer, and of a paler colour, and is the root of a ſpecies of the Chryſanthemum. Pyrethrum of either of theſe kinds is violently acrid and pungent, whence it is of great ſervice in the tooth ach, and other diſorders of the head. It vellicates the nerves, and aſſiſts in opening their obſtructions, and hence is given in ſleepy diſeaſes, apoplexies, lethargies, and in palſies of the tongue. It is ſometimes added to clyſters given in apoplectic and lethargic caſes.

PYRETICS, medicines good againſt fevers. See FEVER and FEBRIFUGE.

PYRICUBIUM, in natural hiſtory, the name of a genus of foſſil bodies, uſually comprehended, with many others of very different figures and ſtructures, under the general name of pyrites. See PYRITES.

PYRIFORMIS, in anatomy, a muſcle of the thigh, receiving its name from its figure, which reſembles that of a pear. It riſes thick from the lower part of the os ſacrum, where it is joined to the ileum; from thence it runs tranſverſely towards the joint of the hip, and terminates in a ſhort tendon, which is inſerted in the middle of the internal labium of the upper edge of the great trochanter, by two or three branches.

PYRIPLACIS, in natural hiſtory, the name of a genus of pyrites, the characters of which are theſe: they are compound, inflammable, metallic bodies, found in looſe detached maſſes, of a ſimple and uniform, not ſtriated, internal ſtructure, and are covered with an inveſtient coat or cruſt. See the article PYRITES.

PYRIPOLYGONIUM, in natural hiſtory, the name of a genus of foſſils, the characters of which are, that they are compound, metallic bodies, of a regular figure, conſiſting of twelve planes.

There is only one known ſpecies of this genus, tho' ſubject to great varieties in its appearance; and this has been by authors hitherto confounded, with many other bodies of a very different nature and figure, under the general name pyrites.

PYRITES, or PYRITÆ, in natural hiſtory, a name uſed for a claſs of compound inflammable metallic bodies found in detached maſſes, but of no determinately angular figure. This claſs Doctor Hill divides into two orders, the firſt of which, being thoſe pyritæ of a plain and ſimple internal ſtructure, comprehends two genera: the firſt genus, termed pyriplaces, are thoſe pyritæ of a ſimple internal ſtructure, and covered with an inveſtient coat or cruſt; the ſecond genus, termed gymnopyres, are thoſe pyritæ of a ſimple internal ſtructure, and not covered with a cruſt; the ſecond order being thoſe pyritæ of a regularly ſtriated internal ſtructure alſo comprehends two genera, the firſt termed pyritricha are thoſe pyritæ of a ſimple ſtriated texture; the ſecond genus called pyritrichiphylla are thoſe pyritæ whoſe ſtriæ terminate in foliaceous ends.

This foſſile is recommended by ſome authors as an emmenagogue, but it is ſcarce ever preſcribed with this intention; the common green vitriol, or copperas of the ſhops, is made from it; and an acid ſomewhat different from that of pure vitriol may be drawn off from it by the retort, after it has been expoſed to the air till it moulders away: this is of great uſe in mineralogy, and is a ſolvent for ſeveral foſſils that none of the other acids will touch. See the article VITRIOL.

PYRITRICHIPHYLLUM, in natural hiſtory, the name of a genus of foſſils of the claſs of the pyrites, the characters of which are theſe: they are compound, inflammable, metallic bodies, found in looſe maſſes, not of any regularly angular figure, and of a ſtriated texture, with foliaceous ends to the ſtriæ, appearing on the ſurface or within the maſs. See the article PYRITES.

PYRITRICHUM, in natural hiſtory, the name of a genus of pyrites, the characters of which are theſe: they are compound, inflammable, metallic foſſils, always found in detached maſſes of no regularly angular figure, and of a ſimple ſtriated ſtructure. See the article PYRITES.

PYRMONT, the capital of a county of that name in the circle of Weſtphalia in Germany, ſituated on the confines of the dutchy of Brunſwic, in eaſt long. 9°; north lat. 52°, from whence we receive the beſt mineral waters in Germany.

The country all about where theſe ſprings are, abound with materials which give virtue to the waters, and the quarries of ſtone wherever they are dug ſend up ſpirituous and martial exhalations, as well as the ſprings that run from them; and the water in general has a vitriolic taſte. Hoffman obſerves, that theſe waters contain a volatile and ſubtile principle greatly more penetrating and ſtrong, as well as in larger quantities, than any other mineral water; but that this is not to be expected in them any where but upon the ſpot, for thoſe who tranſport them to other places, are conſtrained to let a part of this fly off to preſerve the reſt. If either glaſs or earthen veſſels be filled at the ſpring, and immediately corked or faſtened down, the conſequence is, that they will burſt on the firſt motion, or heat of the weather. They are therefore forced to fill them only in part firſt, and let them ſtand a while for this ſubtile ſpirit to exhale; and then a while after filling them up, to cork and fit them for carriage. If they are drank on the ſpot in a morning upon an empty ſtomach, they affect the noſe with a pungent tingling, and diſturb the head for many hours afterwards. If they are taken at the ſpring, they purge but very little; but if taken in another place after tranſportation they purge conſiderably more, and render the ſtools black. It is obſervable alſo, that if they are left in an open veſſel a few days, their virtue wholly exhales, and they no longer purge. If tea-leaves, balauſtine-flowers, or galls, are put into this water, they firſt change it to a blue, from that to a purple, and finally into a black; a little ſpirit of vitriol added to this liquor renders it as limpid as before. If any acid be mixed with this water there is raiſed an effervescence, and bubbles of air are carried up in great quantity. If any alkaline liquor be added, there is no ebullition raiſed, but the liquor becomes turbid and milky; and the ſpirit of vitriol added to this renders it limpid again, &c. It appears upon the whole, that the pyrmont-waters poſſeſs a pure extremely penetrating and elaſtic mineral ſpirit, and that in a very large proportion; and to this their virtues are to be principally attributed.

The great quantity of this powerful ſpirit, contained in the waters, makes them more fit for the robuſt and ſtrong conſtitutions, when depraved by illneſs, than for the weak and tender ones; but even the tendereſt people may take them, only by obſerving to take but a ſmall doſe, or to dilute them with an equal quantity of common water immediately before taking them. They are of great efficacy in ſtrengthening the tone of the viſcera, opening obſtructions, and ſtimulating in a proper manner the excretory ducts, ſo as to make them duly perform their office: and Hoffman, on his own experience, recommends them, mixed with equal quantities of milk, as good in ſcorbutic and gouty caſes.

For the imitation of pyrmont-water, or making it artificially, ſo that it will not only reſemble the natural, but will have the ſame effect as a medicine, ſee the article MINERAL *Waters*.

PYROCTOGONIUM, in natural hiſtory, the name given by Dr. Hill to a genus of foſſils comprehended by authors, with many others, under the general name pyrites. See the article PYRITES.

PYROLA, WINTER-GREEN, in botany, a genus of the decandria-monogynia claſs of plants, the corolla whereof conſiſts of five roundiſh, hollow, patent petals; the fruit is a roundiſh, depreſſed, pentagonal capſule, containing five cells, and opening at the angles; the ſeeds are numerous, very ſmall, and paleaceous. See plate CCXXV. fig. 4.

In medicine, this plant has the credit of being eſteemed for its refrigerating, deſiccative, aſtringent, and conſolidating virtues; and it is very noted as a vulnerary, whether uſed internally or externally.

PYROMANCY, πυρομαντεια, a kind of divination by means of fire. The antients imagined they could foretel future events, by inſpecting fire and flame; and to this end, they conſidered its direction, which way it turned: ſometimes they added other matters to the fire, ſuch as a veſſel full of urine, having its neck bound about with wool, watching narrowly on which ſide it burſt, and thence taking their augury: ſometimes they threw pitch on it; and, if it took fire immediately, they eſteemed it a good augury.

PYROTECHNY, πυροτεχνια, the art of fire, or a ſcience which teaches the management

nagement and application of fire, in ſeveral operations. Pyrotechny is of two kinds, military and chemical: military pyrotechny is the doctrine of artificial fire-works and fire arms, teaching the ſtructure and uſe of thoſe uſed in war, the attacking of fortifications, &c. as gun-powder, cannons, bombs, granadoes, carcaſſes, mines, fuſees, &c. and thoſe made for amuſement's ſake, as rockets, ſtars, ſerpents, &c. See the article GUN-POWDER, CANNON, &c.

Chemical pyrotechny is the art of managing and applying fire in diſtillations, calcinations, and other operations of chemiſtry. See FIRE, DISTILLATION, &c.

PYROTICS, πυρωτικα, in medicine, cauſtics, or remedies, either actually or potentially hot; and which accordingly will burn the fleſh, and raiſe an eſchar. See the article CAUSTICS.

PYRRHICHA, πυρριχη, in antiquity, a kind of exerciſe on horſeback, or a feigned combat, for the exerciſe of the cavalry.

PYRRHICHIUS, in the greek and latin poetry, a foot conſiſting of two ſyllables, both ſhort, as *deus*. See FOOT.

PYRRHONIANS, PYRRHONEANS, or PYRRHONISTS, a ſect of antient philoſophers, ſo called from Pyrrho, a native of Elis, in Peloponneſus. The opinions of theſe philoſophers, who were alſo called ſceptics, terminated in the incomprehenſibility of all things, in which they found reaſon both for affirming and denying; accordingly they ſeemed, during their whole lives, to be in ſearch of truth, without ever acknowledging that they had found it: hence the art of diſputing upon all things, without ever going farther than ſuſpending our judgment, is called pyrrhoniſm.

Pyrrho maintained, that life and death were equally indifferent; and he is charged with teaching, that honour and infamy, the juſtice and injuſtice of actions, depended ſolely on human laws and cuſtoms; and in a word, that there is nothing in itſelf honeſt or diſhoneſt, juſt or unjuſt: an abominable doctrine, that opens the way to all manner of crimes.

PYRUS, the PEAR-TREE, in botany, a genus of the icoſandria-pentagynia claſs of plants, the corolla whereof conſiſts of five roundiſh concave petals, inſerted into the calyx; the fruit is an umbilicated apple, of a figure approaching to round, fleſhy, and containing five cells, formed by membranes: the ſeeds are oblong, obtuſe, acuminated at the baſe, convex on one ſide, and plane on the other.

Under this genus is comprehended the apple and the quince tree.

The fruit of this plant is refrigerating, aſtringent, &c.

PYTHAGOREANS, a ſect of antient philoſophers, ſo denominated from their being the followers of Pythagoras of Samos, who lived in the reign of Tarquin, the laſt king of the Romans, in the year of Rome 220; or, according to Livy, in the reign of Servius Tullius, in the year of the world 3472.

Pythagoras, from his extraordinary deſire of knowledge, travelled in order to enrich his mind with the learning of the ſeveral countries through which he paſſed. He was the firſt who took the name of philoſopher, that is, a lover of wiſdom, which implied, that he did not aſcribe the poſſeſſion of wiſdom to himſelf, but only the deſire of poſſeſſing it.

His maxims of morality were admirable; for he was for having the ſtudy of philoſophy ſolely tend to elevate man to a reſemblance of the Deity. He believed that God is a ſoul diffuſed through all nature, and that from him human ſouls are derived; that they are immortal, and that men need only take pains to purge themſelves of their vices, in order to be united to the Deity. He made unity the principle of all things; and believed, that between God and man there are various orders of ſpiritual beings, who are the miniſters of the ſupreme being. He condemned all images of the Deity, and would have him worſhipped with as few ceremonies as poſſible. His diſciples brought all their goods into a common ſtock, contemned the pleaſures of ſenſe, abſtained from ſwearing, eat nothing that had life, and believed in the doctrine of a metempſychoſis. See the article METEMPSYCHOSIS.

Pythagoras made his ſcholars undergo a ſevere noviciate of ſilence for at leaſt two years; and it is ſaid, that where he diſcerned too great an itch for talking, he extended it to five: his diſciples were therefore divided into two claſſes, of which the firſt were ſimple hearers, and the laſt ſuch as were allowed to propoſe their difficulties, and learn the reaſons of all that was taught there. The pythagoreans, it is ſaid, on their riſing from bed, rouſed the mind with the ſound of the lyre, in order to make them more fit for the actions of the day; and at night re-

ſumed the lyre, in order to prepare themſelves for ſleep, by calming all their tumultuous thoughts. The figurative manner in which he gave his inſtructions, was borrowed from the Hebrews, Egyptians, and other orientals. Some think he derived his philoſophy from the books of Moſes, and that he converſed with Ezekiel and Daniel at Babylon; but this is mere conjecture.

Some authors ſay, that he left nothing in writing; but Laërtius and others attribute ſeveral treatiſes to him. His golden verſes, attributed by ſome to one of his diſciples, are allowed to be an exact copy of the ſentiments of that divine philoſopher, from whoſe ſchool proceeded the greateſt philoſophers and legiſlators.

PYTHEUMA, in botany, a plant of the pentandria-monogynia claſs, with a monopetalous flower, divided into five linear ſegments, diſpoſed ſtar-ways; the fruit is a roundiſh trilocular capſule, containing a great many ſmall and roundiſh ſeeds.

PYTHIA, in antiquity, the prieſteſs of Apollo at Delphi, by whom he delivered oracles: ſhe was thus called from the god himſelf, who was denominated Apollo Pythios, from his ſlaying the ſerpent Python.

This prieſteſs was to be a pure virgin ſhe ſat on the lid of a brazen veſſel, mounted on a tripod or three-legged ſtool; and thence, after a violent enthuſiaſm, delivered her oracles in a few ambiguous and obſcure verſes, or in a ſhort ſentence in proſe. See ORACLE.

PYTHIAN GAMES, in antiquity, ſolemn games celebrated near Delphi, in honour of Apollo, and in remembrance of his having killed the ſerpent Python.

Theſe were held every two years, about the month Elapheholion, which anſwered to our February. The celebration of theſe games was attended with the pythian ſong, in which was celebrated the fight of Apollo and the ſerpent. The victors were crowned with branches of laurel; tho', at the firſt inſtitution, the crown was of beech-leaves. See GAMES.

PYXIDIUM, CUP-MOSS, in botany, a genus of moſſes, conſiſting of a firm, tough, and flexile matter, formed into the ſhape of hollowed cups, or drinking glaſſes, with longer or ſhorter ſtems.

PYXIS NAUTICA, the SEAMAN'S COMPASS. See the article COMPASS.

PYXIS, in anatomy, the acetabulum, or cavity of the hip-bone. See the articles ACETABULUM and FEMUR.

Q.

Q, or q, the ſixteenth letter, and twelfth conſonant, of our alphabet; but is not to be found either in the greek, old latin, or ſaxon alphabets; and indeed ſome would entirely exclude it, pretending that k ought to be uſed wherever this occurs: however, as it is formed in the voice in a different manner, it is undoubtedly a diſtinct letter; for in expreſſing this ſound the cheeks are contracted, and the lips, particularly the under one, are put into a cannular form, for the paſſage of the breath.

The q is never ſounded alone, but in conjunction with u, as in *quality*, *queſtion*, *quite*, *quote*, &c. and never ends any engliſh word.

As a numeral, Q ſtands for 500; and with a daſh over it, thus $\overline{Q}$, for 500000.

Uſed as an abbreviature, q. ſignifies quantity, or quantum: thus, among phyſicians, q. pl. is quantum placet, *i. e.* as much as you pleaſe of a thing; and q. ſ. quantum ſufficit, *i. e.* as much as is neceſſary. Q. E. D. among mathematicians, is quod erat demonſtrandum, *i. e.* which was to be demonſtrated; and Q. E. F. quod erat faciendum, *i. e.* which was to be done. Q. D. among grammarians, is quaſi dictum, *i. e.* as if it were ſaid, or, as who ſhould ſay. In the notes of the antients, Q. ſtands for Quintus, or Quintius; Q. B. V. for quod bene vertat; Q. S. S. S. for quæ ſupra ſcripta ſunt; Q. M. for Quintus Mutius, or quomodo; Quint. for Quintilius; and Quæſ. for quæſtor.

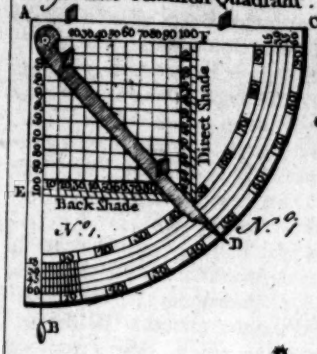
QUACK, among phyſicians, the ſame with empiric. See the article EMPIRIC.

QUADRA, in building, any ſquare bordure, or frame, encompaſſing a baſſo relievo, pannel, painting, or other work: it is alſo uſed, but erroneouſly, for a frame or bordure, of any other form, as round, oval, or the like.

QUADRAGESIMA, a denomination given

QUADRANTS.

Fig. 1. The common Quadrant.



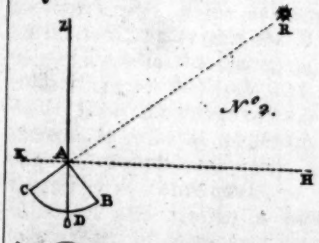


Fig. 2. Astronomical Quadrant.

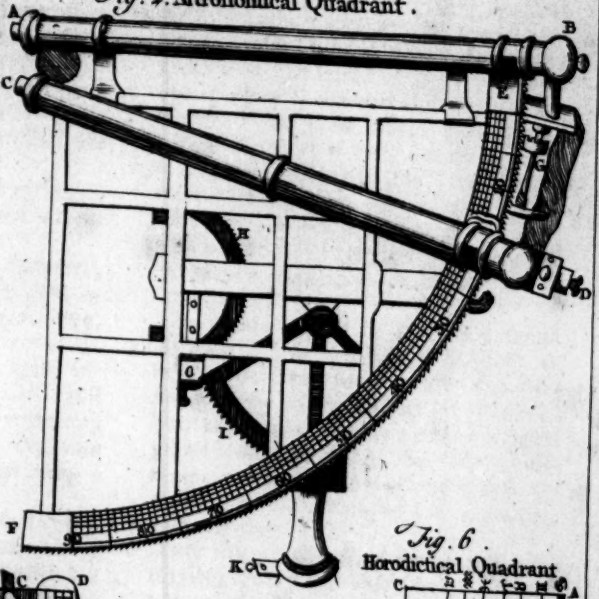


Fig. 3. Cole's Quadrant.

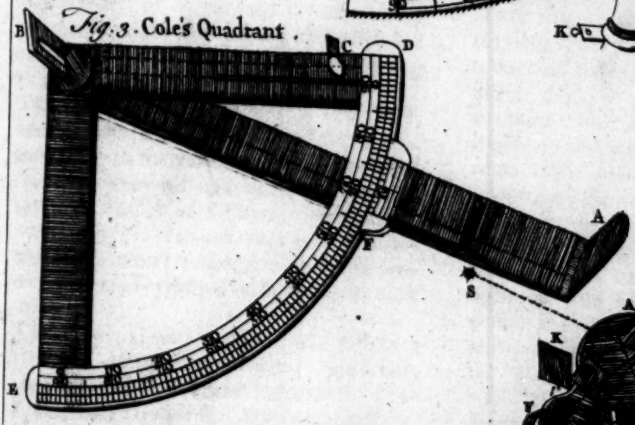


Fig. 6. Horodictical Quadrant.

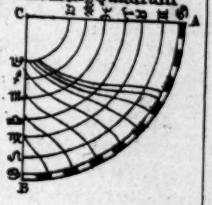


Fig. 4. Gunter's Quadrant.

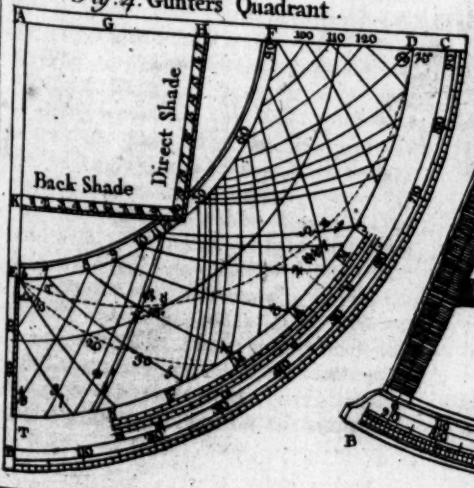
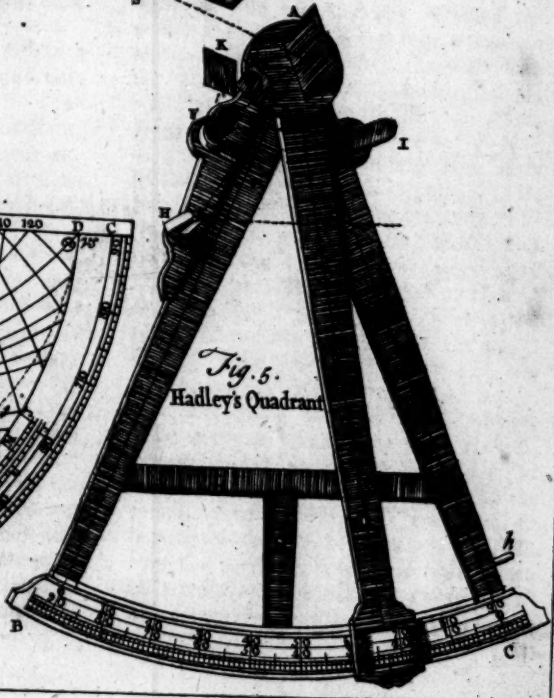


Fig. 5. Hadley's Quadrant.



J. Jefferys sculp.

BRITISH MUSEUM

given to lent, from its conſiſting of forty days. See the article LENT.

Hence alſo the firſt Sunday of lent is called Quadrageſima-ſunday, and the three preceding Sundays, Quinquageſima, Sexageſima, and Septuageſima.

QUADRANGLE, in geometry, the ſame with a quadrilateral figure, or one conſiſting of four ſides and four angles. See the article QUADRILATERAL.

QUADRANS, the quarter or fourth part of any thing, particularly the *as*, or pound. See the article AS.

QUADRANT, *quadrans*, in geometry, an arch of a circle, containing 90°, or the fourth part of the entire periphery. See the articles CIRCLE and DEGREE.

Sometimes alſo the ſpace, or area, included between this arch and two radii drawn from the center to each extremity thereof, is called a quadrant, or, more properly, a qudrantal ſpace, as being a quarter of an entire circle.

QUADRANT alſo denotes a mathematical inſtrument, of great uſe in aſtronomy and navigation, for taking the altitudes of the ſun and ſtars, as alſo for taking angles in ſurveying, &c.

This inſtrument is variouſly contrived, and furniſhed with different apparatus, according to the various uſes it is intended for; but they all have this in common, that they conſiſt of a quarter of a circle, whoſe limb is divided into 90°. Some have a plummet ſuſpended from the center, and are furniſhed with ſights to look through.

The principal and moſt uſeful quadrants are the common ſurveying quadrant, aſtronomical quadrant, Adam's quadrant, Cole's quadrant, Davis's quadrant, Gunter's quadrant, Hadley's quadrant, horodictical quadrant, Sutton's or Collin's quadrant, and the ſinical quadrant, &c. of each of which in order.

1. The common ſurveying quadrant, ABC (pl. CCXXII. fig. 1. n° 1. is made of braſs, wood, or any other ſolid ſubſtance; the limb of which BC, is divided into 90°, and each of theſe farther divided into as many equal parts as the ſpace will allow, either diagonally or otherwiſe. On one of the ſemi-diameters AC, are fitted two moveable ſights; and to the center is ſometimes alſo fixed a label, or moveable index AD, bearing two other ſights; but in lieu of theſe laſt ſights there is ſometimes fitted a teleſcope: alſo from the center there is hung a thread with a plummet; and on the under ſide, or face of the inſtrument is fitted a ball and ſocket, by means of which it may be put into any poſition. The general uſe of it is for taking angles in a vertical plane, comprehended under right lines going from the center of the inſtrument, one of which is horizontal, and the other is directed to ſome viſible point. But beſides the parts already deſcribed, there is frequently added on the face near the center, a kind of compartment, EF, called the quadrat, or geometrical ſquare; which is divided as in the figure, and will be farther deſcribed under the article QUADRAT.

This quadrant may be uſed in different ſituations: for obſerving heights or depths, its plane muſt be diſpoſed perpendicularly to the horizon; but to take horizontal diſtances, its plane is diſpoſed parallel thereto: again, heights and diſtances may be taken two ways, *viz.* by means of the fixed ſights and plummet, or by the label.

As to the manner of meaſuring angles by this quadrant: Let there be an angle in a vertical plane, comprehended between a line parallel to the horizon HK and the right line RA, (*ibid.* n° 2.) coming from the ſun, moon, a ſtar, or any remarkable point of a tower, or hill: now to meaſure this angle RAH by the quadrant, let the inſtrument be placed in the vertical plane, ſo as that its center A may be in the angular point, and let the ſights on the ſide CA be directed towards the object at R; then the degrees and minutes in the arch BD, cut off by the plummet or perpendicular, AD, will meaſure the angle RAH: for, from the make of the quadrant, BAC is a right angle; therefore BAR is likewiſe a right angle, being equal to it. But, becauſe HK is horizontal, and AD perpendicular to the horizon, HAD will be a right angle; and therefore BAR = HAD, and BAR − HAB = HAD − HAB, or RAH = BAD: but the arch BD is the meaſure of the angle BAD, conſequently it is likewiſe the meaſure of RAH. *Q. E. D.*

The remaining arch on the quadrant, DC, is the meaſure of the angle RAZ, comprehended between the foreſaid right line, RA, and AZ which points to the zenith; ſo that the arch DC meaſures, or is equal to the zenith diſtance = ∠RAZ.

For the farther uſe of this inſtrument, in meaſuring heights and diſtances, as alſo for taking angles like a graphometer.

ter. See the articles HEIGHT, GRAPHOMETER, SURVEYING, &c.

2. The aſtronomical quadrant is a large one uſually made of braſs, or wooden bars faced with iron-plates; having its limb, F E, (pl. CCXXII. fig. 2.) nicely divided either diagonally, or otherwiſe, into degrees, minutes, and ſeconds; and furniſhed with two teleſcopes, one fixed on the ſide of the quadrant, at A B; and the other C D, moveable about the center, by means of the ſcrew, G. The dented wheels, (I, H,) ſerve to direct the inſtrument to any object, or phænomenon.

The uſe of this curious inſtrument, in taking obſervations of the ſun, planets, and fixed ſtars is obvious; for being turned horizontally upon its axis, by means of the teleſcope A B, till the object is ſeen through the removeable teleſcope; then the degrees, &c. cut by the index, give the altitude required.

3. Adams's quadrant differs only from Cole's quadrant, in having an horizontal vane, with the upper part of the limb lengthened; ſo that the glaſs, which caſts the ſolar ſpot on the horizon-vane, is at the ſame diſtance from the horizon-vane as the ſight-vane at the end of the index.

4. Cole's quadrant is a very uſeful inſtrument invented by Mr. Benjamin Cole: it conſiſts of ſix parts, *viz.* the ſtaff A B (pl. CCXXII. fig. 3.) the quadrantal-arch D E; three vanes A, B, C; and the vernier, F G.

The ſtaff is a bar of wood about two feet long, an inch and a quarter broad, and of a ſufficient thickneſs to prevent it from bending or warping. The quadrantal arch is alſo of wood, being nearly equal in ſtrength to the ſmall arch of Davis's quadrant, and is divided into degrees, and third parts of a degree, to a radius of about nine inches; to its extremities are fixed two radii, which meet in the center of the quadrant by a pin, round which it eaſily moves. The ſight-vane A is a thin piece of braſs almoſt two inches in height, and one broad, placed perpendicularly on the end of the ſtaff A, by the help of two ſcrews paſſing through its foot. Through the middle of this vane is drilled a ſmall hole, like that in the ſight vane of Davis's quadrant, through which the coincidence or meeting of the horizon and ſolar ſpot is to be viewed. The horizon-vane B is about an inch broad, and two inches and a half high, having a ſlit cut through it of near an inch long, and a quarter of an inch broad; this vane is fixed in the center-pin of the inſtrument, in a perpendicular poſition, by the help of two ſcrews paſſing through its foot, whereby its poſition, with reſpect to the ſight-vane, is always the ſame; their angle of inclinations being equal to forty-five degrees. The ſhade-vane C is compoſed of two braſs plates; the one, which ſerves as an arm, is about four inches and a half long, and three quarters of an inch broad, being pinned, at one end, to the upper limb of the quadrant by a ſcrew, about which it has a ſmall motion; the other end lies in the arch, and the lower edge of the arm is directed to the middle of the center-pin: the other plate, which is properly the vane, is about two inches long, being fixed perpendicularly to the other plate, at about half an inch diſtance from that end next the arch; this vane may be uſed either by its ſhade, or by the ſolar ſpot caſt by a convex lens placed therein. And, becauſe the wood-work is often apt to warp or twiſt, therefore this vane may be rectified by the help of a ſcrew, ſo that the warping of the inſtrument may occaſion no error in the obſervation, which is performed in the following manner: ſet the line G on the vernier againſt a degree on the upper limb of the quadrant, and turn the ſcrew on the backſide of the limb forward or backward, till the hole in the ſight-vane, the center of the glaſs, and the ſunk ſpot in the horizon-vane, lie in a right-line.

To find the ſun's altitude by this inſtrument: turn your back to the ſun, holding the inſtrument by the ſtaff, with your right hand, ſo that it be in a vertical plane paſſing through the ſun; apply your eye to the ſight-vane, looking through that and the horizon-vane till you ſee the horizon; with the left hand ſlide the quadrantal arch upwards, until the ſolar ſpot or ſhade, caſt by the ſhade-vane, fall directly on the ſpot or ſlit in the horizon-vane; then will that part of the quadrantal arch, which is raiſed above G or S (according as the obſervation reſpected either the ſolar ſpot or ſhade) ſhew the altitude of the ſun at that time. But, if the meridian altitude be required, the obſervation muſt be continued, and, as the ſun approaches the meridian, the ſea will appear through the horizon-vane, and then is the obſervation finiſhed; and the degrees and minutes counted as before, will give

give the ſun's meridian altitude: or the degrees counted from the lower limb upwards will give the zenith-diſtance.

5. Davis's quadrant, ſo called from its inventor captain Davis, has already been deſcribed under the arttcle BACK-STAFF. This inſtrument has got the name of back-ſtaff, becauſe the obſerver's back is turned towards the ſun, in taking its altitude: it is alſo called, eſpecially among foreigners, the engliſh quadrant.

6. Gunter's quadrant, ſo called from its inventor Edmund Gunter, is repreſented in plate CCXXII. fig. 4; and beſides the apparatus of other quadrants, has a ſtereographical projection of the ſphere on the plane of the equinoctial. It has alſo a calendar of the months, next to the diviſions of the limb.

Uſe of Gunter's quadrant. 1. To find the ſun's meridian altitude for any given day, or the day of the month for any given meridian altitude. Lay the thread to the day of the month in the ſcale next the limb; and the degree it cuts in the limb, is the ſun's meridian altitude. Thus the thread, being laid on the 15th of May cuts 59° 30′, the altitude ſought; and contrarily the thread, being ſet to the meridian altitude, ſhews the day of the month. 2. To find the hour of the day. Having put the bead, which ſlides on the thread, to the ſun's place in the ecliptic, obſerve the ſun's altitude by the quadrant; then, if the thread be laid over the ſame in the limb, the bead will fall upon the hour required. Thus ſuppoſe on the 10th of April, the ſun being then in the beginning of Taurus, I obſerve the ſun's altitude by the quadrant to be 36°; I place the bead to the beginning of Taurus in the ecliptic, and lay the thread over 36° of the limb; and find the bead to fall on the hour-line marked 3 and 9: accordingly the hour is either 9 in the morning, or 3 in the afternoon. Again, laying the bead on the hour given, having firſt rectified, or put it to the ſun's place, the degree cut by the thread on the limb gives the altitude. Note, the bead may be rectified otherwiſe, by bringing the thread to the day of the month, and the bead to the hour-line of 12. 3. To find the ſun's declination from his place given, and contrariwiſe. Set the bead to the ſun's place in the ecliptic, move the thread to the line of declination E T, and the bead will cut the degree of declination required. Contrarily, the bead being adjuſted to a given declination, and the thread moved to the ecliptic, the bead will cut the ſun's place. 4. The ſun's place being given, to find his right aſcenſion, or contrarily. Lay the thread on the ſun's place in the ecliptic, and the degree it cuts on the limb is the right aſcenſion ſought. Contrarily, laying the thread on the right aſcenſion, it cuts the ſun's place in the ecliptic. 5. The ſun's altitude being given, to find his azimuth, and contrariwiſe. Rectify the bead for the time, as in the ſecond article, and obſerve the ſun's altitude; bring the thread to the complement of that altitude; thus the bead will give the azimuth ſought, among the azimuth lines. 6. To find the hour of the night from ſome of the five ſtars laid down on the quadrant. 1. Put the bead to the ſtar you would obſerve, and find how many hours it is off the meridian, by article 2. Then, from the right aſcenſion of the ſtar, ſubſtract the ſun's right aſcenſion converted into hours, and mark the difference; which difference, added to the obſerved hour of the ſtar from the meridian, ſhews how many hours the ſun is gone from the meridian, which is the hour of the night. Suppoſe on the 15th of May the ſun is in the 4th degree of gemini, I ſet the bead to arcturus; and, obſerving his altitude, find him to be in the weſt about 52° high, and the bead to fall on the hour-line of 2 in the afternoon; then will the hour be 11 hours 50 min. paſt noon, or 10 min. ſhort of midnight: for 62°, the ſun's right aſcenſion, converted into time, make 4 hours 8 min. which ſubtracted from 13 hours 58 min. the right aſcenſion of arcturus, the remainder will be 9 hours 50 min. which added to 2 hours, the obſerved diſtance of arcturus from the meridian, ſhews the hour of the night to be 11 hours 50 minutes.

7. Hadley's quadrant, (plate CCXXII. fig. 5.) ſo called from its inventor J. Hadley, eſq; conſiſts of the following particulars: 1. An octant, or ⅛ part of a circle, A B C. 2. An index D. 3. The ſpeculum E. 4. Two horizontal glaſſes, F, G. 5. Two ſcreens, K, K. 6. Two ſight-vanes, H, I.

The octant conſiſts of two radii, A B, A C, which are ſtrengthened by the braces L, M, and the arch B C; which though containing only 45°, is nevertheleſs divided into 90 primary diviſions, each

each of which ſtands for degrees, and are numbered 0, 10, 20, 30, &c. to 90; beginning at each end of the arch for the convenience of numbering both ways, either for altitudes or zenith-diſtances: again, each degree is ſubdivided into minutes.

The index D, is a flat bar, moveable round the center of the inſtrument; and that part of it which ſlides over the graduated arch, B C, is open in the middle, with Vernier's ſcale on the lower part of it; and underneath is a ſcrew, ſerving to faſten the index againſt any diviſion.

The ſpeculum E, is a piece of flat glaſs, quickſilvered on one ſide, ſet in a braſs-box, and placed perpendicular to the plane of the inſtrument, the middle part of the former coinciding with the center of the latter. And, becauſe the ſpeculum is fixed to the index, the poſition of it will be altered by the moving of the index along the arch. The rays of an obſerved object are received on the ſpeculum, and from thence reflected on one of the horizon glaſſes, F, G; which are two ſmall pieces of looking-glaſs placed on one of the limbs, their faces being turned obliquely to the ſpeculum, from whence they receive the reflected rays of obſerved objects. This glaſs, F, has only its lower part quickſilvered, and ſet in braſs-work; the upper part being left tranſparent to view the horizon. The glaſs G has in its middle a tranſparent ſlit, through which the horizon is to be ſeen. And becauſe the warping of the wood-work, and other accidents, may diſtend them from their true ſituation, there are three ſcrews paſſing through their feet, whereby they may be eaſily replaced.

The ſcreens are two pieces of coloured glaſs, ſet in two ſquare braſs-frames K, K, which ſerve as ſcreens to take off the glare of the ſun's rays which would be otherwiſe too ſtrong for the eye; the one is tinged much deeper than the other, and, as both of them move on the ſame center, they may be both or either of them uſed: in the ſituation they appear in the figure, they ſerve for the horizon-glaſs F; but, when they are wanted for the horizon-glaſs G, they muſt be taken from their preſent ſituation, and placed on the quadrant above G.

The ſight-vanes are two pins, H and I, ſtanding at right angles to the plane of the inſtrument; that at H has one hole in it, oppoſite to the tranſparent ſlit in the horizon-glaſs G; the other, at I, has two holes in it, the one oppoſite to the middle of the tranſparent part of the horizon-glaſs F, the other rather lower than the quickſilvered part: this vane has a piece of braſs on the back of it, which moves round a center, and ſerves to cover either of the holes.

There are two ſorts of obſervations to be made with this inſtrument; the one, when the back of the obſerver is turned towards the object, and therefore called the back-obſervation; the other, when the face of the obſerver is turned towards the object, which is called the fore-obſervation.

To rectify the inſtrument for the fore-obſervation: ſlacken the ſcrew in the middle of the handle behind the glaſs F; bring the index cloſe to the button *b*; hold the inſtrument in a vertical poſition, with the arch downwards; look through the right hand hole in the vane I, and through the tranſparent part of the glaſs F, for the horizon; and if it lies in the ſame right line with the image of the horizon, ſeen on the quickſilvered part, the glaſs F is rightly adjuſted; but, if the two horizon-lines diſagree, turn the ſcrew at the end of the handle backwards or forwards, until thoſe lines coincide, then faſten the middle ſcrew of the handle, and the glaſs is rightly adjuſted.

To take the ſun's altitude by the fore-obſervation: having fixed the ſcreens above the horizon-glaſs F, and ſuited them proportionally to the ſtrength of the ſun's rays, turn your face towards the ſun, holding the inſtrument with your right hand, by the braces L, M, in a vertical poſition, with the arch downwards; put your eye cloſe to the right hand hole in the vane I, and view the horizon through the tranſparent part of the horizon-glaſs F, moving at the ſame time the index D, with your left hand, till the reflex ſolar ſpot coincides with the line of the horizon; then the degrees counted from C, or that end next your body, will give the altitude of the ſun at that time, obſerving to add or ſubtract 16 min. according as the upper or lower edge of the ſun's reflex image is made uſe of. But to obtain the ſun's meridian altitude, which is the thing wanted, in order to find the latitude; the obſervations muſt be continued, and, as the ſun approaches the meridian, the index D muſt be continually moved towards B, in order to maintain the coincidence between the reflex ſolar ſpot and the hori-

zon; and conſequently, as long as this motion can maintain the ſame coincidence, the obſervation muſt be continued and when the ſun has attained the meridian, and begins to deſcend, the coincidence will require a retrograde motion of the index, or towards C; and then is the obſervation finiſhed, and the degrees counted, as before, will give the ſun's meridian altitude, or thoſe from B, the zenith-diſtance; obſerving to add 16′ = ſemidiam. ⊙, if the ſun's lower edge is brought to the horizon; or to ſubſtract 16′, when the horizon and upper edge coincide.

To take the altitude of a ſtar by the fore-obſervation: through the vane H, and the tranſparent ſlit in the glaſs G, look directly to the ſtar; and at the ſame time move the index, till the image of the horizon behind you, being reflected by the great ſpeculum, is ſeen in the quick-ſilvered part of G, and meets the ſtar; then will the index ſhew the degrees of the ſtar's altitude.

To rectify the inſtrument for the back obſervation: ſlacken the ſcrew in the middle of the handle, behind the glaſs G; turn the button *b* on one ſide, and bring the index as many degrees before *o*, as is twice the dip of the horizon at your height above the water; hold the inſtrument vertical with the arch downwards, look through the hole of the vane H, and if the horizon, ſeen through the tranſparent ſlit in the glaſs G, coincides with the image of the horizon, ſeen in the quick-ſilvered part of the ſame glaſs; then the glaſs G is in its proper poſition. But if not, ſet it by the handle, and faſten the ſcrew as before.

To take the ſun's altitude by the back obſervation: put the ſtem of the ſcreens K, K, into the hole *r*, and, in proportion to the ſtrength or faintneſs of the ſun's rays, let one, both, or neither of the frames of thoſe glaſſes be turned cloſe to the face of the limb; hold the inſtrument in a vertical poſition, with the arch downwards, by the braces L, M, with your left hand; turn your back towards the ſun, and put your eye cloſe to the hole, in the vane H, obſerving the horizon through the tranſparent ſlit in the horizon-glaſs G; with your right hand move the index D, till the reflected image of the ſun be ſeen in the quick-ſilvered part of the glaſs G, and in a right line with the horizon; ſwing your body to and fro, and if the obſervation be well made, the ſun's image will be obſerved to bruſh the horizon, and the degrees reckoned from C, or that part of the arch fartheſt from your body, will give the ſun's altitude, at the time of obſervation; obſerving to add 16 min. = the ſun's ſemidiameter, if the ſun's upper edge be uſed; and ſubtract 16 min. from the altitude, if the obſervation reſpected the lower edge.

The directions here given, eſpecially if joined with thoſe delivered under the article LATITUDE, for taking of altitudes at ſea, would be ſufficient, were there not two corrections neceſſary to be made, before the altitude can be accurately aſſigned, *viz.* one on account of the obſerver's eye being raiſed above the level of the ſea, and the other on account of the refraction occaſioned in ſmall altitudes by the hazineſs of the atmoſphere.

We ſhall therefore give a table, ſhewing the corrections neceſſary to be made to altitudes on both theſe accounts, whether it be taken by Davis's or Hadley's quadrant, or any other inſtrument.

height of the eye in feet.	corrections in minutes.	altitude in degrees.	corrections in minutes.	altitude in degrees.	corrections in minutes.
5	2′	1	23′	12	4′
10	3′	2	17½′	15	3½′
15	4′	3	14′	20	2½′
20	5′	4	11′	25	2′
25	6½′	5	9′	30	1½′
30	6′	6	8′	35	1⅓′
35	6½′	7	7′	40	1′
40	7′	8	6′	50	0¾′
45	7½′	9	5½′	60	0½′
50	8′	10	5′	70	0⅓′

General rules for uſing this table of corrections. 1. In the fore-obſervations: add the ſum of the corrections to the obſerved zenith-diſtance, for the true zenith-diſtance; or, take the ſum of the corrections from the obſerved altitude, and the remainder will be the altitude. 2. In the back-obſervations, add the dips, or corrections for the height of the eye, and ſubſtract the refractions, for altitudes; and for zenith-diſtances, ſubſtract the dips, and add the refractions.

Example: By a back obſervation, the altitude of the ſun's lower edge was found by Hadley's quadrant to be 25° 12′; the eye being 30 feet above the horizon,

rizon. By the table the dip on 30 feet is 6′, and the refraction on 25° is 2′; therefore 25° 12′−16′ (= ſemidiam ⊙) = 24° 56′, and 24° 56′ + 6′ (by rule 2) = 25° 2′, and laſtly 25° 2′ − 2′ (by rule 2) = 25° = the true, or corrected altitude.

We have been the more particular in our deſcription and uſe of Hadley's quadrant, as it is undoubtedly the beſt hitherto invented.

8. Horodictical quadrant, a pretty commodious inſtrument, ſo called from its uſe in telling the hour of the day.

Its conſtruction is this: from the center of the quadrant, C, (plate CCXXII. fig. 6.) whoſe limb A B is divided into 90°, deſcribe ſeven concentric circles at intervals at pleaſure; and to theſe add the ſigns of the zodiac, in the order repreſented in the figure. Then, applying a ruler to the center C, and the limb A B, mark upon the ſeveral parallels the degrees correſponding to the altitude of the ſun when therein, for the given hours; connect the points belonging to the ſame hour with a curve line, to which add the number of the hour. To the radius C A fit a couple of ſights, and to the center of the quadrant C tie a thread with a plummet, and upon the thread a bead to ſlide.

If now the bead be brought to the parallel wherein the ſun is, and the quadrant directed to the ſun, till a viſual ray paſs thro' the ſights, the bead will ſhew the hour. For the plummet, in this ſituation, cuts all the parallels in the degrees correſponding to the ſun's altitude. Since then the bead is in the parallel which the ſun deſcribes, and thro' the degrees of altitude to which the ſun is elevated every hour, there paſs hour-lines, the bead muſt ſhew the preſent hour. Some repreſent the hour-lines by arches of circles, or even by ſtraight lines, and that without any ſenſible error.

9. Sutton's or Collins's Quadrant, (plate CCXXIII. fig. 1.) is a ſtereographic projection of one quarter of the ſphere, between the tropics, upon the plane of the ecliptic, the eye being in its north-pole; it is fitted to the latitude of London. The lines, running from the right hand to the left, are parallels of altitude; and thoſe croſſing them are azimuths. The leſſer of the two circles, bounding the projection, is one fourth of the tropic of capricorn; the greater is one fourth of that of cancer. The two ecliptics are drawn from a point on the left edge of the quadrant, with the characters of the ſigns upon them; and the two horizons are drawn from the ſame point. The limb is divided both into degrees and time; and, by having the ſun's altitude, the hour of the day may be found here to a minute.

The quadrantal arches next the center contain the calendar of months; and under them, in another arch, is the ſun's declination.

On the projection are placed ſeveral of the moſt noted fixed ſtars between the tropics; and the next below the projection is the quadrant and line of ſhadows.

To find the time of the ſun's riſing or ſetting, his amplitude, his azimuth, hour of the day, &c. by this quadrant: lay the thread over the day and the month, and bring the bead to the proper ecliptic, either of ſummer or winter, according to the ſeaſon, which is called rectifying; then, moving the thread, bring the bead to the horizon, in which caſe the thread will cut the limb in the time of the ſun's riſing or ſetting, before or after ſix; and at the ſame time the bead will cut the horizon in the degrees of the ſun's amplitude.

Again, obſerving the ſun's altitude with the quadrant, and ſuppoſing it found 45° on the fifth of May, lay the thread over the fifth of May, bring the bead to the ſummer ecliptic, and carry it to the parallel of altitude 45°; in which caſe the thread will cut the limb at 55° 15′, and the hour will be ſeen among the hour-lines to be either 41′ paſt nine in the morning, or 19′ paſt two in the afternoon.

Laſtly, the bead among the azimuths ſhews the ſun's diſtance from the ſouth 50° 41′.

But note, that if the ſun's altitude be leſs than what it is at ſix o'clock, the operation muſt be performed among thoſe parallels above the upper horizon; the bead being rectified to the winter ecliptic.

10. Sinical quadrant (pl. CCXXIII. fig. 2.) conſiſts of ſeveral concentric quadrantal arches, divided into eight equal parts by radii, with parallel right lines croſſing each other at right angles.

Now any one of the arches, as B C. may repreſent a quadrant of any great circle of the ſphere, but is chiefly uſed for the horizon

BRITISH MUSEUM

QUADRANTS.

Fig. 1. Sutton's Quadrant.

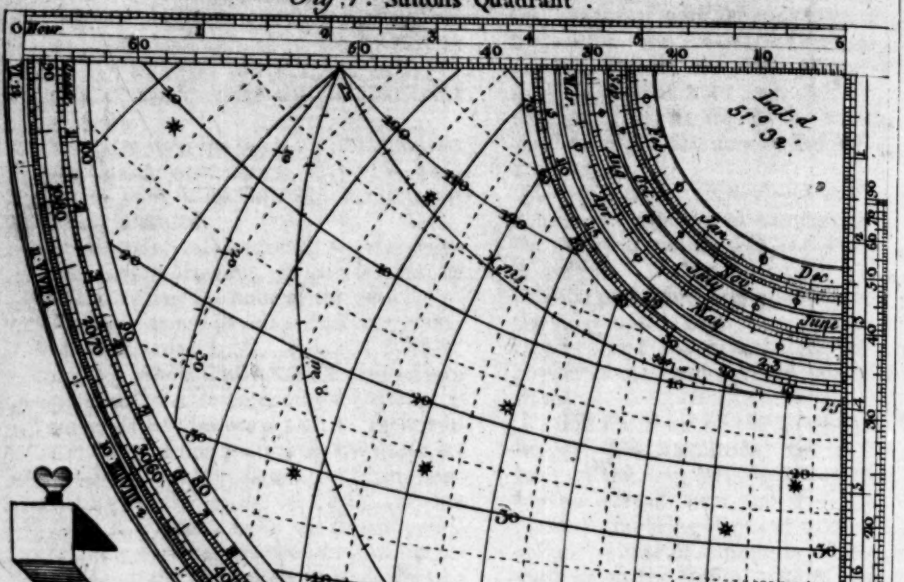


Fig. 3. Gunner's Quadrant.

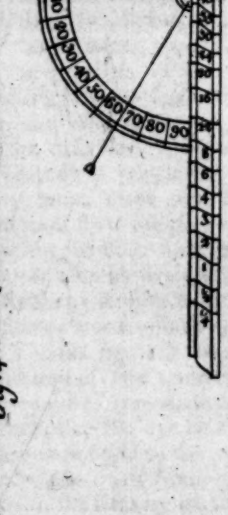


Fig. 4. The Quadrant of Altitude.

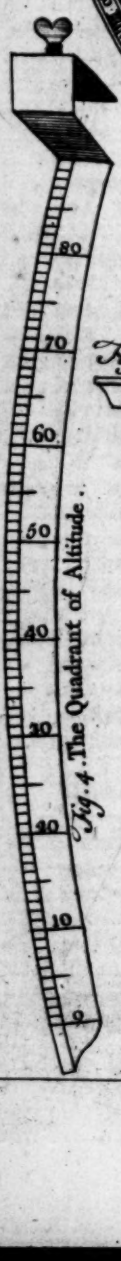
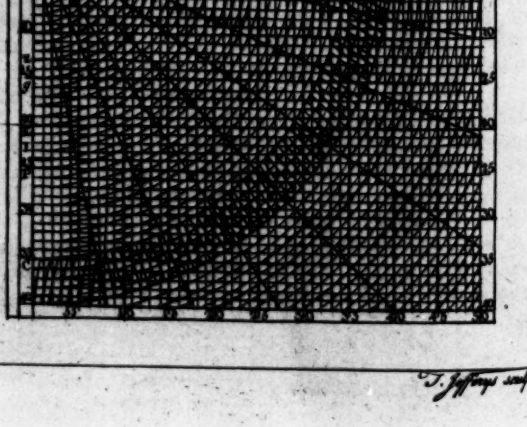


Fig. 2. The Sinical Quadrant.



T. Jefferys sculp.

horizon or meridian. If then BC be taken for a quadrant of the horizon, either of the ſides, as AB, may repreſent the meridian; and the other ſide, AC, will repreſent a parallel, or line of eaſt and weſt: and all the other lines, parallel to AB, will alſo be meridians; and all thoſe parallel to AC, eaſt and weſt lines, or parallels.

Again, the eight ſpaces into which the arches are divided by the radii, repreſent the eight points of the compaſs in a quarter of the horizon; each containing 11° 15′.

The arch BC is likewiſe divided into 90°, and each degree ſubdivided into 12′, diagonal-wiſe.

To the center is fixed a thread, which, being laid over any degree of the quadrant, ſerves to divide the horizon.

If the ſinical quadrant be taken for a fourth part of the meridian, one ſide thereof, AB, may be taken for the common radius of the meridian and equator; and then the other, AC will be half the axis of the world. The degrees of the circumference, BC, will repreſent degrees of latitude, and the parallels to the ſide AB, aſſumed from every point of latitude to the axis AC, will be radii of the parallels of latitude, as likewiſe the ſine complement of thoſe latitudes.

Suppoſe then it be required to find the degrees of longitude contained in 83 of the leſſer leagues, in the parallel of 48°; lay the thread over 48° of latitude on the circumference, and count thence the 83 leagues, on AB beginning at A; this will terminate in H, allowing every ſmall interval 4 leagues. Then tracing out the parallel HE, from the point H to the thread; the part AE of the thread ſhews that 125 greater or equinoctial leagues make 6° 15′; and therefore that the 83 leſſer leagues AH, which make the difference of longitude of the courſe, and are equal to the radius of the parallel HE, make 6° 15′ of the ſaid parallel.

If the ſhip ſails an oblique courſe, ſuch courſe, beſides the north and ſouth greater leagues, gives leſſer leagues eaſterly and weſterly, to be reduced to degrees of longitude of the equator. But theſe leagues being made neither on the parallel of departure, nor on that of arrival, but in all the intermediate ones; we muſt find a mean proportional parallel between them.

To find this, we have on the inſtrument a ſcale of croſs latitudes. Suppoſe then it were required to find a mean parallel between the parallels of 40° and 60°; with your compaſſes take the middle between the 40th and 60th degree on the ſcale: this middle point will terminate againſt the 51ſt degree, which is the mean parallel required.

The principal uſe of the ſinical quadrant is to form triangles upon, ſimilar to thoſe made by a ſhip's way, with the meridians and parallels; the ſides of which triangles are meaſured by the equal intervals between the concentric quadrants, and the lines N and S, E and W: and every fifth line and arch is made deeper than the reſt.

Now ſuppoſe a ſhip to have ſailed 150 leagues north-eaſt, one fourth north, which is the third point, and makes an angle of 33° 45′ with the north-part of the meridian: here are given the courſe and diſtance ſailed, by which a triangle may be formed on the inſtrument, ſimilar to that made by the ſhip's courſe; and hence the unknown parts of the triangle may be found. Thus ſuppoſing the center A to repreſent the place of departure; count, by means of the concentric circles along the point the ſhip ſailed on, *viz.* AD, 150 leagues: then in the triangle AED, ſimilar to that of the ſhip's courſe, find AE = difference of latitude; and DE = difference of longitude, which muſt be reduced according to the parallel of latitude come to. See the article LONGITUDE, *&c.*

11. Gunner's quadrant (plate CCXXIII. fig. 3.) ſometimes called gunner's ſquare, is that uſed for elevating and pointing cannon, mortars, *&c.* and conſiſts of two branches either of braſs or wood, between which is a quadrantal arch divided into 90°, beginning from the ſhorter branch, and furniſhed with a thread and plummet, as repreſented in the plate above referred to.

The uſe of the gunner's quadrant is extremely eaſy; for if the longeſt branch be placed in the mouth of the piece, and it be elevated till the plummet cut the degree neceſſary to hit a propoſed object, the thing is done.

Sometimes on one of the ſurfaces of the long branch, are noted the diviſion of diameters, and weights of iron-bullets, as alſo the bores of pieces.

QUADRANT *of altitude*, (plate CCXXIII. fig. 4.) is an appendage of the artificial globe, conſiſting of a lamina, or ſlip of braſs, the length of a quadrant of one of

the great circles of the globe, and graduated. At the end, where the diviſion terminates, is a nut riveted on, and furniſhed with a ſcrew, by means whereof the inſtrument is fitted on to the meridian, and moveable round upon the rivet, to all points of the horizon, as repreſented in the figure referred to.

Its uſe is to ſerve as a ſcale in meaſuring of altitudes, amplitudes, azimuths, &c. See the article GLOBE.

QUADRANTAL, in roman antiquity, a veſſel every way ſquare like a die, ſerving as a meaſure of liquids; its capacity was eighty libræ or pounds of water, which made forty-eight ſextaries, two urnæ, or eight congii.

QUADRANTAL TRIANGLE, a ſpherical triangle, one of whoſe ſides at leaſt is a quadrant of a circle, and one of its angles a right angle. See TRIANGLE.

QUADRAT, *quadratum*, a mathematical inſtrument, called alſo a geometrical ſquare, and line of ſhadows: it is frequently an additional member on the face of the common quadrant, as alſo on thoſe of Gunter's and Sutton's quadrant; but we ſhall deſcribe it by itſelf, as being a diſtinct inſtrument.

It is made of any ſolid matter, as braſs, wood, &c. or of any four plain rules joined together at right angles, as repreſented in plate CCXXIV. fig. 1. n° 1. where A is the center, from which hangs a thread with a ſmall weight at the end, ſerving as a plummet. Each of the ſides, BE, and DE, is divided into an hundred equal parts; or, if the ſides be long enough to admit of it, into a thouſand parts; C and F are two ſights, fixed on the ſide AD. There is, moreover, an index GH, which, when there is occaſion, is joined to the center A, in ſuch a manner as that it can move freely round, and remain in any given ſituation: on this inſtrument are two ſights, K, L, perpendicular to the right line going from the center of the inſtrument. The ſide DE is called the upright ſide, or the line of the direct or upright ſhadows; and the ſide BE is termed the reclining ſide, or the line of the verſed or back-ſhadows.

To meaſure an acceſſible height, AB, (*ibid.* n° 2.) by the quadrat, let the diſtance BD be meaſured, which ſuppoſe =96 feet, and let the height of the obſerver's eye be 6 feet; then holding the inſtrument with a ſteady hand, or rather reſting it on a ſupport, let it be directed towards the ſummit A, ſo that it may be ſeen clearly through both ſights; the perpendicular or plum-line mean while hanging free, and touching the ſurface of the inſtrument: let now the perpendicular be ſuppoſed to cut off on the upper ſide, KN, 80 equal parts; it is evident, that LKN, ACK, are ſimilar triangles, and (by prop. 4. lib. 6. of Euclid) NK:KL::KC (*i. e.* BD):CA; that is, 80:100::96:CA; therefore, by the rule of three, $CA=\frac{96\times 100}{80}=120$ feet; and CB=6 feet being added, the whole height BA is 126 feet.

If the obſerver's diſtance, as DE (*ibid.*) be ſuch, that, when the inſtrument is directed as formerly towards the ſummit A, the perpendicular fall on the angle P, and the diſtance BE or CG be 120 feet, CA will alſo be 120 feet: for PG:GH::GC:CA; but PG=GH, therefore GC=CA; that is, CA will be 120 feet, and the whole height BA=126 feet, as before.

But let the diſtance BF (*ibid.*) be 300 feet, and the perpendicular or plum-line cut off 80 equal parts from the reclining ſide. Now, in this caſe, the angles QAC, QZI, are equal (29. 1. Eucl.) as are alſo the angles QZI, ZIS: therefore ∠ZIS=QAC; but ZSI=QCA, as being both right: hence, in the æquiangular triangles ACQ, SZI, we have (by 4. 6. Eucl.) ZS:SI::CQ:CA; that is, 100:40::300:CA, or $CA=\frac{40\times 300}{100}=120$; and by adding 6 feet, the obſerver's height, the whole height BA will be 126 feet.

To meaſure any diſtance, at land or ſea, by the quadrat. In this operation, the index AH is to be applied to the inſtrument, as was ſhown in the deſcription; and, by the help of a ſupport, the inſtrument is to be placed horizontally at the point A (*ibid.* n° 3.) then let it be turned till the remote point, F, whoſe diſtance is to be meaſured, be ſeen through the fixed ſights: and bringing the index to be parallel with the other ſide of the inſtrument, obſerve through its ſights any acceſſible mark B, at a diſtance; then carrying the inſtrument to the point B, let the immoveable ſights be directed to the firſt ſtation A, and the ſights of the index to the point F. If the index cut the right ſide of the ſquare, as in K, the pro-

BRITISH MUSEUM

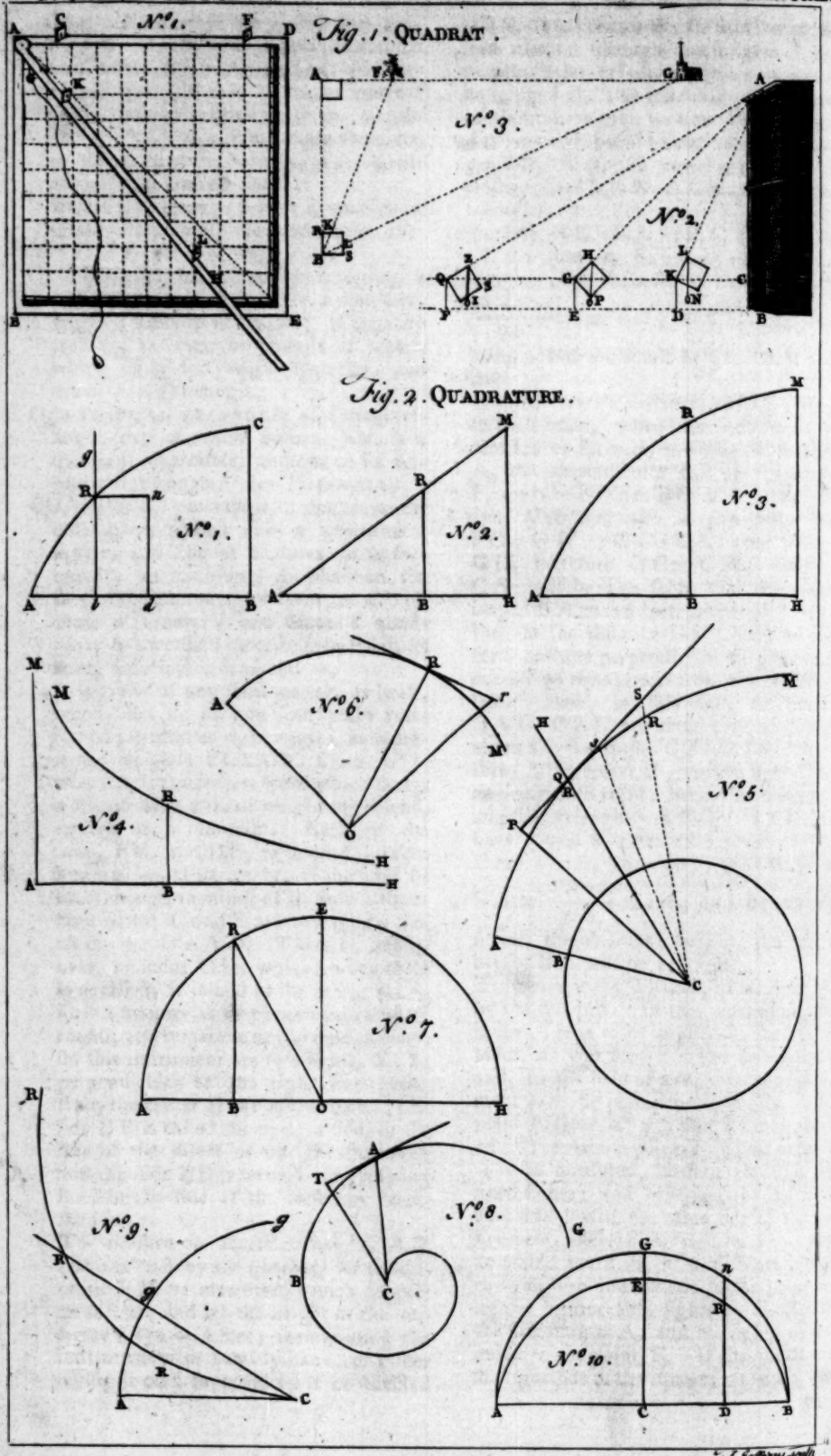


Fig. 1. QUADRAT.
N.o 1.
Fig. 2. QUADRATURE.
N.o 1.
N.o 2.
N.o 3.
N.o 4.
N.o 5.
N.o 6.
N.o 7.
N.o 8.
N.o 9.
N.o 10.
J. Jeffreys sculp.

proportion will be (by 4. 6.) BR : RK :: BA (the diſtance of the ſtations to be meaſured with a chain) : AF, the diſtance ſought. But if the index cut the reclined ſide of the ſquare, in the point L; then the proportion is LS : SB :: BA : AG, the diſtance ſought; which, accordingly, may be found by the rule of three.

QUADRAT, in aſtrology, the ſame with quartile. See the article QUARTILE.

QUADRAT, in printing, a piece of metal caſt like the letters, to fill up the void ſpaces between words, &c. There are quadrats of different ſizes, as m quadrats, n quadrats, &c. which are, reſpectively, of the dimenſions of theſe letters.

QUADRATA LEGIO, a ſquare legion, in roman antiquity, one conſiſting of four thouſand men. See LEGION.

QUADRATIC EQUATION, in algebra, that wherein the unknown equality is of two dimenſions, or raiſed to the ſecond power. See EQUATION and POWER.

Conſtruction of QUADRATIC EQUATIONS. See the article CONSTRUCTION.

QUADRATING *of a piece*, among gunners, is the due placing of a piece of ordnance, and poiſing it in its carriage, and having its wheels of an equal height, &c. See the article GUNNERY.

QUADRATO-CUBUS, QUADRATO-QUADRATO-CUBUS, and QUADRATO CUBO-CUBUS, according to Diophantus, Vieta, Oughtred, &c. denotes the fifth, ſeventh, and eighth powers. See the article POWER.

QUADRATO-QUADRATUM, or BIQUADRATUM, the fourth power of numbers, or the product of the cube when multiplied by the root.

QUADRATRIX, in geometry, a mechanical line, by means whereof we can find right lines equal to the circumference of circles, or other curves, and their ſeveral parts.

QUADRATRIX *of Dinoſtrates*, ſo called from its inventor Dinoſtrates, is a curve, whereby the quadrature of the circle is effected mechanically.

QUADRATRIX *Tſchirnhauſiana*, is a tranſcendental curve invented by M. Tſchirnhauſen, whereby the quadrature of the circle is likewiſe effected.

QUADRATUM-CUBI, QUADRATO-QUADRATO-QUADRATUM, and QUADRATUM-SURDESOLIDI, according to the Arabs, denote the ſixth, eighth, and tenth powers of numbers. See POWER.

QUADRATURE, QUADRATURA, in geometry, denotes the ſquaring, or reducing a figure to a ſquare. Thus, the finding of a ſquare, which ſhall contain juſt as much ſurface or area, as a circle, an ellipſis, a triangle, &c. is the quadrature of a circle, ellipſis, &c.

The quadrature of rectilinear figures, or method of finding their areas, has been delivered under their ſeveral articles TRIANGLE, PARALLELOGRAM, TRAPEZIUM, POLYGON, &c.

But the quadrature of curvilinear ſpaces, as the circle, ellipſis, parabola, &c. is a matter of much deeper ſpeculation, making a part of the higher geometry; wherein the doctrine of fluxions is of ſingular uſe. See FLUXION.

Caſe I. Let ARC (plate CCXXIV. fig. 2. n° 1.) be a curve of any kind, whoſe ordinates R*b*, CB, are perpendicular to the axis AB. Imagine a right line *b*R*g*, perpendicular to AB, to move parallel to itſelf from A towards B; and let the velocity thereof, or the fluxion of the abſciſs A*b*, in any propoſed poſition of that line, be denoted by *bd*, then will *bn*, the rectangle under *bd* and the ordinate *b*R, expreſs the correſponding fluxion of the generating area A*b*R; which fluxion, if A*b* = *x*, and *b*R = *y*, will be $y\dot{x}$. From whence, by ſubſtituting for *y* or $\dot{x}$, according to the equation of the curve, and taking the fluent, the area itſelf A*b*R will become known.

But in order to render this ſtill more plain, we ſhall give ſome examples, wherein *x*, *y*, *z*, and *u* are all along put to denote the abſciſs, ordinate, curve-line, and the area reſpectively, unleſs where the contrary is expreſsly ſpecified.

Thus, if the area of a right angled triangle be required; put the baſe AH (*ib.* n° 2.) = *a*, the perpendicular HM = *b*, and let AB = *x*, be any portion of the baſe, conſidered as a flowing quantity; and let BR = *y*, be the ordinate, or perpendicular correſponding. Then becauſe of the ſimilar triangles AHM and ABR, we ſhall have $a : b :: x : y = \frac{bx}{a}$.

Whence, $y\dot{x}$, the fluxion of the area ABR, is, in this caſe, equal to $\frac{b\,x\,\dot{x}}{a}$; and conſequently the fluent thereof, or the area itſelf, $= \frac{bx^2}{2a}$: which, therefore, when $x = a$, and BR coincides with HM, will become $\frac{ab}{2} = \frac{AH \times HM}{2}$ = the area

of the whole triangle AHM; as is alſo demonſtrable from the principles of common geometry. See TRIANGLE.

Again, let the curve ARMH (*ibid.* n° 3.) whoſe area you would find, be the common parabola; in which caſe, if AB = x, and BR = y, and the parameter = a; we ſhall have $y^2 = ax$, and $y = a^{\frac{1}{2}} x^{\frac{1}{2}}$: and therefore $\dot{u}$ ($= y\dot{x}$) = $a^{\frac{1}{2}} x^{\frac{1}{2}} \dot{x}$; whence $u = \frac{2}{3} \times a^{\frac{1}{2}} x^{\frac{3}{2}} = \frac{2}{3} a^{\frac{1}{2}} x^{\frac{1}{2}} \times x = \frac{2}{3} yx = \frac{2}{3} \times AB \times BR$. Hence a parabola is two-thirds of a rectangle of the ſame baſe and altitude.

The ſame concluſion might have been found more eaſily in terms of y: for $x = \frac{y^2}{a}$, and $\dot{x} = \frac{2y\dot{y}}{a}$; and conſequently $\dot{u}$ ($= y\dot{x}$) = $\frac{2y^2\dot{y}}{a}$; whence $u = \frac{2y^3}{3a} = \frac{2y}{3} \times \frac{y^2}{a} = \frac{2y}{3} \times x = \frac{2}{3} \times AB \times BR$, as before.

To determine the area of the hyperbolic curve AMRB (*ibid.* n° 4.) whoſe equation is $x^m y^n = a^{m+n}$; whence we have $y = \frac{a^{\frac{m+n}{n}}}{x^{\frac{m}{n}}} = a^{\frac{m+n}{n}} \times x^{\frac{-m}{n}}$; and therefore $\dot{u}$ ($= y\dot{x}$) = $a^{\frac{m+n}{n}} \times x^{\frac{-m}{n}} \dot{x}$, whoſe fluent is $u = \frac{a^{\frac{m+n}{n}} \times x^{\frac{n-m}{n}}}{\frac{n-m}{n}} = \frac{na^{\frac{m+n}{n}} \times x^{\frac{n-m}{n}}}{n-m}$; which, when $x = 0$, will alſo be $= 0$, if n be greater than m; therefore the fluent requires no correction in this caſe; the area AMRB, included between the aſymptote AM, and the ordinate BR, being truly defined by $\frac{na^{\frac{m+n}{n}} \times x^{\frac{n-m}{n}}}{n-m}$, as above. But if n be leſs than m, then the fluent, when $x = 0$, will be infinite, becauſe the index $\frac{n-m}{n}$ being negative, 0 becomes a diviſor to $na^{\frac{m+n}{n}}$; whence the area AMRB will alſo be infinite.

But here, the area BRH, comprehended between the ordinate, the curve, and the part BH, of the aſymptote, is finite, and will be truly expreſſed by $\frac{na^{\frac{m+n}{n}} \times x^{\frac{n-m}{n}}}{n-m}$, the ſame quantity with its ſigns changed: for the fluxion of the part AMRB being $a^{\frac{m+n}{n}} \times x^{\frac{-m}{n}} \dot{x}$, that of its ſupplement BRH muſt conſequently be $-a^{\frac{m+n}{n}} \times x^{\frac{-m}{n}} \dot{x}$, whereof the fluent is $-\frac{a^{\frac{m+n}{n}} \times x^{\frac{n-m}{n}}}{\frac{n-m}{n}} = \frac{a^{\frac{m+n}{n}} \times x^{\frac{n-m}{n}}}{m-n}$ = the area BRH, which wants no correction; becauſe when x is infinite, and the area BRH = 0, the ſaid fluent will alſo entirely vaniſh; ſince the value of $x^{\frac{m-n}{n}}$, which is a diviſor to $a^{\frac{m+n}{n}}$, is then infinite.

Caſe II. Let ARM (*ibid.* n° 5.) be any curve, whoſe ordinates CR, CR, are all referred to a point or center; conceive a right line CRH, to revolve about the given center C, and let a point R, move along the ſaid line, ſo as to trace out or deſcribe the propoſed curve ARM. Now it is evident, that, if the point R was to move from any poſition Q, without changing its direction and velocity, it would proceed along the tangent QS, inſtead of the curve, and deſcribe areas QsC, QSC, about the center C, proportional to the times of their deſcription; becauſe thoſe areas or triangles, having the ſame altitude, CP, are as the baſes Qs and QS; and theſe are as the times becauſe the motion in the tangent, upon that ſuppoſition, would be uniform.

Hence, if RS be taken to denote the value of $\dot{z}$, the fluxion of the curve line AR, the correſponding fluxion of the area ARC, will be truly repreſented by the uniformly generated triangle QCS. And putting the perpendicular CP, drawn from the center to the tangent, equal to s, we ſhall have $\frac{s\dot{z}}{2}$ $\left(= \frac{QS \times CP}{2}\right)$; for the fluxion of the area, from whence the area itſelf may be found.

But

But ſince, in many caſes, the value of $\dot{z}$ cannot be computed (from the property of the curve) without conſiderable trouble, the two following expreſſions, for the fluxion of the area, will commonly be found more commodious, *viz.* $\frac{s\dot{y}y}{2t}$ and $\frac{y^2\dot{x}}{2a}$; where $t = RP$, and $x =$ the arch BN of a circle, deſcribed about the center C, at any diſtance a (=CB). Theſe expreſſions are derived from that above, in the following manner, *viz.* $\dot{z} : \dot{y} :: y$ (CR) $: t$ (RP); therefore $\dot{z} = \frac{y\dot{y}}{t}$; and conſequently $\frac{s\dot{z}}{2} = \frac{sy\dot{y}}{2t}$, which is the firſt expreſſion. Again, becauſe the velocity of R, in the direction of the tangent, is denoted by $\dot{z}$, that in a direction perpendicular to CQ (whereby the point R revolves about the center C) will be $(= \frac{CP}{CR} \times \dot{z}) = \frac{s\dot{z}}{y}$; which being to $\dot{x}$, the velocity of the point N, about the ſame center, as the diſtance or radius CR (y) to the radius CN (a) we have $\frac{as\dot{z}}{y} = y\dot{x}$; and conſequently, $\frac{s\dot{z}}{2} = \frac{y^2\dot{x}}{a2}$, which is the other expreſſion.

In order to illuſtrate this caſe, let it be required to determine the area of the circular ſector AOR (*ibid.* n° 6.) for putting the radius AO (or OR) $= a$, the arch AR (conſidered as variable by the motion of R) $= z$, and $Rr = \dot{z}$: the fluxion of the area will here be expreſſed by $\frac{a\dot{z}}{2}$ (= the triangle ORr): whence the area itſelf is $= \frac{az}{2} =$ AO $\times \frac{1}{2}$AR; ſo that it appears, that the area of any circle is expreſſed by a rectangle under half the circumference, and half the diameter. See the article RECTIFICATION.

Again, ſuppoſe it were required to find the area of a ſemi-circle AREH (*ibid.* n° 7.) Put the diameter AH $= a$, AB $= x$, and BR $= y$, &c. as uſual, and we have $y^2 = ax - xx$; and conſequently $\dot{u}$ $(= y\dot{x}) = \dot{x}\sqrt{ax - xx} = a^{\frac{1}{2}}x^{\frac{1}{2}}\dot{x} \times \overline{1 - \frac{x}{a}}^{\frac{1}{2}}$. But as this expreſſion does not admit of a fluent in finite terms, it muſt be reſolved into an infinite ſeries, *viz.*

$$\dot{u} = a^{\frac{1}{2}}x^{\frac{1}{2}}\dot{x} \times 1 - \frac{x}{2a} - \frac{x^2}{8a^2} - \frac{x^3}{16a^3} - \frac{5x^4}{128a^4}$$

&c. $= a^{\frac{1}{2}} \times x^{\frac{1}{2}}\dot{x} - \frac{x^{\frac{3}{2}}\dot{x}}{2a} - \frac{x^{\frac{5}{2}}\dot{x}}{8a^2} - \frac{x^{\frac{7}{2}}\dot{x}}{16a^3}$, &c. From whence the fluent of every term being taken, according to the common method, there will come out $u =$

$$a^{\frac{1}{2}} \times \frac{2x^{\frac{3}{2}}}{3} - \frac{x^{\frac{5}{2}}}{5a} - \frac{x^{\frac{7}{2}}}{28a^2} - \frac{x^{\frac{9}{2}}}{72a^3} - \frac{5x^{\frac{11}{2}}}{704a^4}$$

&c. $= x\sqrt{ax} \times \frac{2}{3} - \frac{x}{5a} - \frac{x^2}{28a^2} - \frac{x^3}{72a^3} - \frac{5x^4}{704a^4}$, &c. = the area ABR. Now when $x = \frac{1}{2}a$, the ordinate BR, will coincide with the radius OE; in which caſe, the area becomes $= \frac{1}{2}a\sqrt{\frac{1}{2}aa} \times \frac{2}{3} - \frac{1}{10} - \frac{1}{112} - \frac{1}{576} - \frac{5}{11264}$, &c. $= \frac{a^2\sqrt{\frac{1}{2}}}{2} \times 0.6666 - 0.1 - 0.0089 - 0.0017 - 0004$, &c. $= 0.1964\, a^2$; which multiplied by 2, gives $0.3928\, a^2$, for the area of the ſemi-circle AEH, nearly.

As the foregoing ſeries converges but ſlowly, it may be of uſe to try, whether, by computing the area of a leſſer portion ABR, that of the whole may not be obtained more quickly; and where x being ſmall in compariſon of a, the ſeries may have ſuch a rate of convergency, that a ſmall number of terms will be ſufficient. Now, in order to this, it is well known that, if the arch AR, be taken $= \frac{1}{3}$ AE, or 30°, the ſine BR will be $\frac{1}{2}$AO; and conſequently AB $(= x) =$ AO $-$ OB $=$ AO $- \sqrt{OR^2 - BR^2}$; which, if the radius AO $= 1$, will be 0.1339746, very nearly. This, therefore, will be the value of a, being ſubſtituted in the fore-mentioned ſeries, *viz.* $\sqrt{ax^3} \times \frac{2}{3} - \frac{x}{5a} - \frac{x^2}{28a^2}$, &c. we have $0.0693505 \times 0.6666666 - 0.0133975 - 0.0001603 - 0.0000042$, &c. $= 0.0693505 \times 0.6531046 = 0.0452931 =$ the area ABR; which, added to the area OBR $(= \text{OB} \times \frac{1}{2}\text{BR} = \sqrt{\frac{3}{4}} \times \frac{1}{4} = 0.2165063)$ gives 0.2617994, for the area of the ſector AOR, the treble whereof 0.7853982 (becauſe AR $= \frac{1}{3}$ AE) will therefore be the area of the whole quadrant AOE: and this number, found by taking only four terms of the ſeries, is true to the laſt decimal place.

If it were required to find the area of the loga-

logarithmic ſpiral CBAC (*ibid.* n° 8.) let the right line AT, touch the curve in A; upon which, from the center C, let fall the perpendicular CT. Then, ſince by the nature of the curve, the angle TAC is every where the ſame; the ratio of AT (t) to CT (s) will here be conſtant; and therefore the fluent of $\frac{s}{t}\times\frac{y\dot{y}}{2}=\frac{s}{t}\times\frac{y^2}{4}=$ the area of CBAC.

Again, to find the area CRRC (*ibid.* n° 9.) of the ſpiral of Archimedes, CRRR; let AC be a tangent to the curve at the center C, about which center, with the radius AC ($=a$) ſuppoſe a circle Agg, to be deſcribed; then the arch (or abſciſs) Ag, correſponding to any propoſed ordinate CR, being to that ordinate in a given or conſtant ratio (ſuppoſe as m to n) we have $x(=Ag)=\frac{my}{n}$; therefore $\dot{u}=\frac{y^2\dot{x}}{2a}=\frac{my^2\dot{y}}{2an}$; and conſequently $u=\frac{my^3}{6an}=$ the area CRRC.

Laſtly, let the curve propoſed be the ellipſis AEB (*ibid.* n° 10.) whoſe area is required; in order to find which, put the tranſverſe axis AB$=a$, and the conjugate axis (2 CE) $=c$, and we ſhall have (by the property of the curve) $y(=DR)=\frac{c}{a}\sqrt{ax-xx}$; and conſequently $\dot{u}(=y\dot{x})=\frac{c}{a}\times\dot{x}\sqrt{ax-xx}=$ the fluxion of the area ARD. But $\dot{x}\sqrt{ax-xx}$ is known to expreſs the fluxion of the correſponding ſegment ADn, of the circumſcribing ſemi circle, whoſe fluent is therefore given, or may be found by the method of quadrating the circle above delivered. Let this fluent be denoted by A, and that of $\frac{c}{a}\times\dot{x}\sqrt{ax-xx}$ will conſequently be $=\frac{c}{a}\times$ A. Hence, the area of the ſegment of an ellipſis is to the area of the correſponding ſegment of its circumſcribing circle, as the leſſer axis of the ellipſis is to the greater; whence it follows, that the whole ellipſis muſt be to the whole circle in the ſame ratio.

QUADRATURE, in aſtronomy, that aſpect of the moon when ſhe is 90° diſtant from the ſun; or when ſhe is in a middle point of her orbit, between the points of conjunction and oppoſition, namely, in the firſt and third quarters. See MOON.

QUADRATURE-LINES, are two lines placed on Gunter's ſector: they are marked with Q. and 5, 6, 7, 8, 9, 10: of which Q. ſignifies the ſide of the ſquare, and the other figures the ſides of polygons of 5, 6, 7, &c. ſides. S, on the ſame inſtrument, ſtands for the ſemi-diameter of a circle, and 90 for a line equal to 90° in circumference.

QUADRATUS, in anatomy, a name given to ſeveral muſcles on account of their ſquare figure; as, 1. The quadratus femoris, or of the thigh, which has its origin from the tubercle of the iſchium, and its termination at an eminence between the two trochanters. 2. The quadratus lumborum, or of the loins, which has its origin in the anterior and ſuperior part of the poſterior proceſs of the os ilei, and its end at the tranſverſe apophyſes of the vertebræ of the loins, the laſt vertebra of the thorax, and the laſt rib. 3. The quadratus of the radius, which has its origin in the lower part of the ulna, and its termination oppoſite to the lower part of the radius.

QUADREL, in building, a kind of artificial ſtone, ſo called from its being perfectly ſquare.

The quadrels are made of chalky earth, &c. and dried in the ſhade for two years. Theſe were formerly in great requeſt among the italian architects.

QUADRIGA, in antiquity, a car or chariot drawn by four horſes.

On the reverſes of medals, we frequently ſee the emperor or victory in a quadriga, holding the reins of the horſes; whence theſe coins are, among the curious, called nummi quadrigati, and victoriati.

QUADRILATERAL, in geometry, a figure whoſe perimeter conſiſts of four right lines, making four angles; whence it is alſo called a quadrangular figure. The quadrilateral figures are either a parallelogram, trapezium, rectangle, ſquare, rhombus, or rhomboides. See TRAPEZIUM, RECTANGLE, &c.

QUADRILL, *quadrilla*, a little troop or company of cavaliers, pompouſly dreſſed, and mounted for the performance of carouſals, juſts, tournaments, runnings at the ring, and other gallant divertiſements. A regular carouſal is ſaid to have at leaſt four, and at moſt twelve quadrills. Of theſe quadrills each is to conſiſt of at leaſt three cavaliers, and at moſt of twelve. The quadrills are diſtinguiſhed by the forms of their habits, or the diverſity of their colours.

QUADRILLE is alſo a game at cards, ſometimes called ombre by four; which chiefly differs from ombre by three, in being

being played by four perſons, and having all the forty cards dealt out, to each perſon, at ten each. See OMBRE.

The general laws of this game are, 1. It is not permitted to deal the cards any otherwiſe than four by three, the dealer being at liberty to begin with which of thoſe numbers he pleaſes. 2. If he who plays either ſans prendre, or calling a king, names a trump of a different ſuit from that his game is in, or names two ſeveral ſuits, that which he firſt named muſt be the trump. 3. He who plays muſt name the trump by its proper name, as he likewiſe muſt the king he calls. 4. He who has ſaid *I paſs*, muſt not be again admitted to play, except he plays by force, upon account of his having ſpadille. 5. He who has aſked the queſtion, and has leave given him to play, is obliged to do it; but he muſt not play ſans prendre except he is forced to do it. 6. He who has the four kings may call the queen of either of his kings. 7. Neither the king nor queen of the ſuit which is trumps, muſt be called. 8. He who has one, or ſeveral kings, may call any king he has in his hand; in ſuch caſe, if he wins, he alone muſt make ſix tricks: if he wins it is all his own, and if he loſes he pays all by himſelf. 9. Every one ought to play in his turn, but for having done otherwiſe no one muſt be beaſted. 10. He, however, whoſe turn it is not to play, having in his hand the king the ombre has called, and ſhall trump about with either ſpadille, manille, or baſto, or ſhall even play down the king that was called, to give notice of his being the friend, muſt not pretend to undertake the vole; nay he muſt be condemned to be beaſted if it appears that he did it with any fraudulent deſign. 11. He who has drawn a card from his game, and preſented it openly in order to play it, is obliged ſo to do, if his retaining it may be either prejudicial to the game or give any intimation to the friend, eſpecially if the card is a matadore: but he who plays ſans prendre, or calls his own king, is not ſubject to this law. 12. None ought to look upon the tricks, nor to count aloud what has been played, except when it is his turn to play, but to let every one reckon for himſelf. 13. He who inſtead of turning up the tricks before any one of his players, ſhall turn up and diſcover his game, muſt be equally beaſted with him whoſe cards he had ſo diſcovered, the one paying one half and the other the like. 14. He who renounces muſt be beaſted as many times as he has ſo done; but if the cards are mixed he is to pay but one beaſt. 15. If the renounce prejudices the game, and the deal is not played out, every one may take up his cards, beginning, at the trick where the renounce was made, and play them over again. 16. He who ſhews the game before the deal is out muſt be beaſted, except he play ſans prendre. 17. None of the three matadores can be commanded down by an inferior trump. 18. If he who plays ſans prendre with the matadores in his hand, demands only one of them, he muſt receive only that he mentioned. 19. He who inſtead of ſans prendre ſhall demand matadores, not having them; or he who ſhall demand ſans prendre inſtead of matadores, cannot compel the players to pay him what is really his due. 20. Matadores are only paid when they are in the hands of the ombre, or of the king his ally, whether all in one hand or ſeparately in both. 21. He who undertakes the vole and does not make it, muſt pay as much as he would have received had he won it. 22. He who plays and does not make three tricks is to be beaſted alone, and muſt pay all that is to be paid; and if he makes no tricks at all, he muſt alſo pay to his two adverſaries the vole, but not to his friend.

QUADRUPEDS, *quadrupedia*, in zoology, a claſs of land-animals, with hairy bodies, and four limbs or legs proceeding from the trunk of their bodies: add to this, that the females of this claſs are viviparous, or bring forth their young alive, and nouriſh them with milk from their teats.

This claſs, though ſtill numerous enough, will be conſiderably leſſened in number, by throwing out of it the frog, lizard, and other four-footed amphibious animals. See the article AMPHIBIOUS.

On the other hand, it will be increaſed by the admiſſion of the bat; which, from its having the fore-feet webbed with a membrane, and uſing them as birds do their wings in flying, has erroneouſly been ranked among the bird-kind. See the article BIRD.

Linnæus, whoſe hiſtory of zoology we have generally followed, ſubdivides the quadruped-claſs into ſix orders, which he characterizes from the number, figure, and diſpoſition of their teeth; the firſt order he calls anthropomorpha, from their reſemblance

ſemblance to the human ſhape: theſe have four fore-teeth in each jaw, as repreſented in plate CCXXV. fig. 1. n° 1. The feræ, or beaſts of prey, make the ſecond order, and are diſtinguiſhed by having ſix ſharp pointed fore-teeth in each jaw, and very long canine teeth, *ibid.* n° 2. The third order, denominated agriæ, is ſufficiently diſtinguiſhed by having no teeth at all, *ibid.* n° 3. The glires make the fourth claſs, and are diſtinguiſhed by having the fore-teeth only two in number, and thoſe prominent: *ibid.* n° 4. The pecora conſtitute the fifth order, and have no fore-teeth at all in the upper-jaw, and the fore-teeth in the lower-jaw are ſix: *ibid.* n° 5. The ſixth and laſt order is that of the jumenta, the teeth of which are few in number, and diſpoſed in an irregular manner, quite different from that of any of the five preceding orders: *ibid.* n° 6. See the article ANTHROPOMORPHA, *&c.*

QUADRUPLATORES, among the Romans, were informers, who had the fourth-part of the confiſcated goods for their pains.

QUADRUPLE, a ſum or number multiplied by four or taken four times.

This word is particularly uſed for a gold-coin worth four times as much as that whereof it is the quadruple.

QUÆ EST EADEM, in law, words uſed in pleadings, to ſupply the want of traverſe; as where a defendant juſtifies a treſpaſs or an aſſault at another day or place than is ſpecified in the plaintiff's declaration, he ought to ſay, *quæ eſt eadem tranſgreſſio*, &c.

QUÆ PLURA, in law, was formerly a writ that lay where an inquiſition had been taken by an eſcheator, of ſuch lands, *&c.* whereof a perſon died ſeiſed, and it was ſuppoſed that all the lands were not found by the inquiſition.

QUÆ SERVITIA, a writ relating to ſervices, *&c.*

QUÆRE, in law, is where any point is doubted of.

QUESTUS, in law, ſignifies whatever a perſon has by purchaſe; as hereditas denotes that which one has by deſcent, or hereditary right. See PURCHASE.

QUAIL, *coturnix*. See COTURNIX.

Quails, on being imported, pay a duty of 1 s. $6\frac{48}{100}$ d. the dozen; and draw back, on exportation, 1 s. $4\frac{20}{100}$ d.

QUAKERS, a religious ſect which made its firſt appearance in England during the interregnum; ſo called, in deriſion, from certain unuſual tremblings with which they were ſeized at their firſt meetings. Their founder was George Fox, a ſhoemaker, born at Draiton, in Leiceſterſhire; who, as he worked at his trade, uſed to meditate much on the Scriptures: at length he began to ſee viſions, and ſet up for a preacher. He propoſed but few articles of faith, inſiſting chiefly on moral virtue, mutual charity, the love of God, and a deep attention to the inward motions and ſecret operations of the ſpirit. He required a plain ſimple worſhip, and a religion without ceremonies, making it a principal point to wait in profound ſilence the directions of the Holy Spirit.

Quakers were at firſt guilty of ſome extravagancies, but theſe wore off, and they ſettled into a regular body, profeſſing great auſterity of behaviour, a ſingular probity and uprightneſs in their dealings, a great frugality at their tables, and a remarkable plainneſs and ſimplicity in their dreſs.

The ſyſtem of the quakers is laid down in fifteen theſes, by Robert Barclay, in a ſenſible, well wrote apology, addreſſed to Charles II. Their principal doctrines are, That God has given to all men, without exception, ſupernatural light, which being obeyed can ſave them; and that this light is Chriſt, the true light, which lighteth every man that cometh into the world: that the Scriptures were indeed given by inſpiration, and are preferable to all the other writings in the world; but that they are no more than ſecondary rules of faith and practice, in ſubordination to the light or ſpirit of God, which is the primary rule: that immediate revelation is not ceaſed, a meaſure of the ſpirit being given to every one: that all ſuperſtitions and ceremonies in religion of mere human inſtitution, ought to be laid aſide; as alſo, in civil ſociety, the ſaluting one another by pulling off the hat, bowing, or the like; and the ſaying *you* inſtead of *thou*, to a ſingle perſon: that men and women ought to be plain and grave in their apparel, ſober and juſt in their whole converſation, and, at a word, in all their dealings; and not to ſwear, to go to war, to fight in private quarrels, or even to bear any carnal weapons. They alſo entirely ſet aſide the two ſacraments, baptiſm and the lord's ſupper; admit no clergy among them, but any one, without diſtinction, who is of a ſober life, and

Fig. 1. QUADRUPEDS

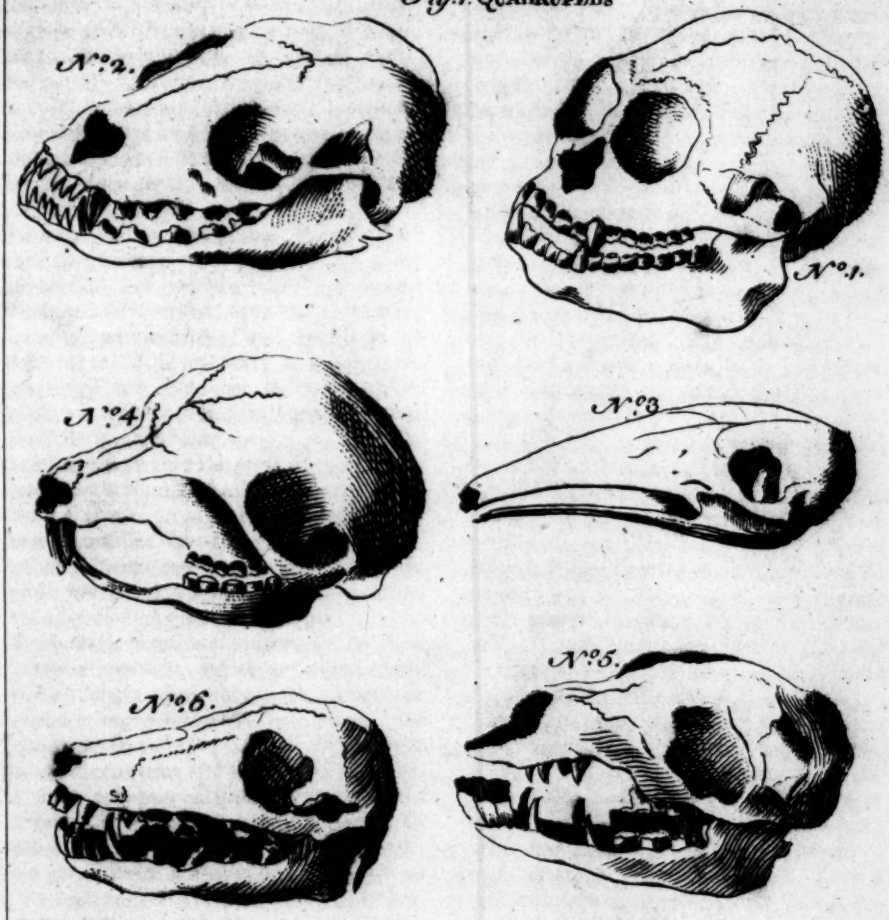


Fig. 3. QUINCUNX

Fig. 2. QUARTERING

Fig. 4. PYROLA, WINTER-GREEN

J. Jefferys sculp.

BRITISH MUSEUM

and believes him or herself to be moved thereto by the spirit, is allowed to preach in their assemblies; and they hold it unlawful to pay tythes, or church rates. In short, they are a quiet inoffensive people, of exemplary morals, remarkably charitable and friendly to each other, and have never yet been guilty of persecution, though they have had it in their power.

As to discipline and polity, the affairs of the community are managed in their assemblies, of which there are several kinds; as monthly, quarterly, yearly, second days meetings, and meetings of sufferings. The monthly and quarterly meetings are held in their respective counties, to which deputies are sent from the several particular meetings, and enquiry is made into the state of each meeting; who violate the laws of the community; who pay tythes or church-rates, and who suffer for the non-payment of either: here too they excommunicate and receive again into their communion. Of all which registers are kept.

From these meetings appeals lie to their yearly assemblies, which are always held in London, and consist of three orders or classes; representatives sent from the quarterly meetings, correspondents from foreign countries and the several counties, and preachers. Hither are transmitted accounts of what has been transacted in all the monthly and quarterly meetings: here measures are concerted, and directions given as to behaviour about tythes, rates, &c. and here they compose differences and make provision for the poor: Here public accounts are audited, and instructions given to the deputies to be observed at their return; and from hence a yearly epistle of admonition is dispatched to be read in all the monthly and quarterly meetings.

The second day's meeting is a standing committee, consisting of the principal preachers in and about the city, who meet every monday to consider of particular cases and exigencies which happen between the yearly meetings.

The meeting of sufferings is held every week, and consists of the correspondents for each county. Its business is to receive complaints for such as have suffered for non-payment of tythes and church-rates, and to procure them relief, either by sending them money, for which they have a settled fund, or by soliciting their cause, or both.

QUALE JUS, in law, a judicial writ which was antiently brought, where a religious person had judgment to recover land before execution was made of the judgment; in which case, it went out to the escheator in order to inquire, whether the person had right to recover, or whether the judgment was obtained by collusion between the demandant and the tenant, with an intention to defraud the lord, &c.

QUALIFICATOR, in the canon-law, a divine appointed to qualify, or declare the quality of a proposition brought before an ecclesiastical tribunal, chiefly before the inquisition. The qualificators of the office are not judges, they only give their sentiments on the proposition presented to them.

QUALIFIED, in law, a person enabled to hold two livings or benefices.

QUALITY, *qualitas*, is defined by Mr. Locke, to be the power in a subject of producing any idea in the mind: thus a snow-ball having the power to produce in us the ideas of white, cold, and round, these powers, as they are in the snow-ball, he calls qualities; and as they are sensations, or perceptions, in our understandings, he calls ideas. See IDEA.

These qualities, according to the same philosopher are of two sorts; first, original or primary qualities, are those inseparable from body, and such as it keeps in all its changes and situations: these are solidity, extension, motion or rest, number and figure: thus, take a grain of wheat, divide it into two parts, each has solidity, extension, figure, mobility; divide it again and it still retains the same qualities, and will do so still, though you divide it on till the parts become insensible. Secondly, secondary qualities are such, whatever reality we by mistake may attribute to them, as in truth are nothing in the objects themselves, but powers to produce various sensations in us, and depend on the qualities before-mentioned; such are colours smells, tastes, sounds, &c.

The ideas of primary qualities of bodies, are resemblances of them, and their patterns really exist in bodies; but the ideas produced in us by secondary qualities have no resemblance of them at all: and what is sweet, blue, or warm, in the idea, is but the certain bulk, figure and motion of the insensible parts in the bodies themselves which we call so: thus we see that fire at one distance produces in us the sensation of

warmth, which at a nearer approach cauſes the ſenſation of pain. Now what reaſon have we to ſay that the idea of warmth is actually in the fire, but that of pain not in the fire, which the ſame fire produces in us the ſame way. The bulk, number, figure, and motion of the parts are really in it, whether we perceive them or no, and therefore may be called real qualities, becauſe they really exiſt in that body; but light and heat are no more really in it than pain or ſickneſs: take away the ſenſation of them, let not the eyes ſee light or colours, nor the ear hear ſounds, let the palate not taſte, nor the noſe ſmell, and all colours, taſtes, odours, and ſounds, as they are ſuch particular ideas, vaniſh and ceaſe, and are reduced to their cauſes, *i. e.* bulk, motion, figure, *&c.* of parts.

Theſe ſecondary qualities are of two ſorts; firſt, immediately perceivable, which by immediately acting on our bodies, produce ſeveral different ideas in us. Secondly, mediately perceivable, which, by operating on other bodies, change their primary qualities ſo as to render them capable of producing ideas in us, different from what they did before. Theſe laſt are powers in bodies, which proceed from the particular conſtitutions of thoſe primary and original qualities, to make ſuch a change in the bulk, figure texture, *&c.* of another body, as to make it operate on our ſenſes differently from what it did before; as in fire, to make lead fluid: theſe two laſt being nothing but powers relating to other bodies, and reſulting from the different modifications of the original qualities, are yet otherwiſe thought of; the former being eſteemed real qualities, but the latter barely powers. The reaſon of this miſtake ſeems to be this, that our ideas of ſenſible qualities, containing nothing in them of bulk, figure, *&c.* we cannot think them the effect of thoſe primary qualities, which appear not to our ſenſes to operate in their productions, and with which they have not any apparent congruity; nor can reaſon ſhew how bodies, by their bulk, figure, *&c.* ſhould produce in the mind the ideas of warm, yellow, *&c.* but in the other caſe, when bodies operate upon one another, we plainly ſee that the quality produced hath commonly no reſemblance with aught in the thing producing it, and therefore we look upon it as the effect of power: but our ſenſes not being able to diſcover any unlikeneſs between the idea produced in us, and the quality of the object producing it, we imagine that our ideas are reſemblances of ſomething in the objects, and not the effects of certain powers placed in the modification of the primary qualities, with which primary qualities the ideas produced in us have no reſemblance.

Secondary qualities, for the moſt part, ſerve to diſtinguiſh ſubſtances; for our ſenſes fail us in the diſcovery of the bulk, figure, texture, *&c.* of the minute parts of bodies, on which their real conſtitutions and differences depend; and ſecondary qualities are nothing but powers with relation to our ſenſes. The ideas that make our complex ones, of corporeal ſubſtances are of three ſorts: firſt, the ideas of primary qualities of things, which are diſcovered by our ſenſes: ſuch are bulk, figure, motion, *&c.* ſecondly, the ſenſible ſecondary qualities, which are nothing but powers to produce ſeveral ideas in us, by our ſenſes; thirdly, the aptneſs we conſider in any ſubſtance, to cauſe or receive ſuch alterations of primary qualities, as that the ſubſtance, ſo altered, ſhould produce in us different ideas from what it did before; and they are called active or paſſive powers. The mind can have no other idea of ſenſible qualities, than what comes from without, by the ſenſes; nor any other idea of the operations of a thinking ſubſtance, than what it finds in itſelf; and as of two primary qualities of body, *viz.* ſolid coherent parts, and impulſe, we have clear and diſtinct ideas, ſo likewiſe have we of two primary qualities of ſpirit, *viz.* thinking, and a power of action: and as we have clear and diſtinct ideas of ſeveral qualities inherent in bodies, which are but the various modifications of the extenſion of cohering ſolid parts, and their motion; ſo we have likewiſe the ideas of the ſeveral modes of thinking, *viz.* believing, doubting, hoping, fearing, *&c.*

Chemical QUALITIES, thoſe qualities principally introduced by means of chemical experiments, as fumigation, amalgamation, cupellation, volatilization, precipitation, *&c.*

To theſe chemical qualities ſome others might be added, which, becauſe of the uſe which phyſicians principally make of them, may be called medical qualities; whereby ſome ſubſtances, received into the human body, are reſolving, diſcuſſing, abſterſive, *&c.*

QUALITY is alſo uſed for a kind of title given to certain perſons, in regard of their

their territories, ſignories, or other pretenſions.

QUAM DIU SE BENE GESSERIT, a clauſe frequently to be found in letters patent of the grant of offices, as in thoſe to the barons of the exchequer, *&c.* where it intimates that they ſhall hold the ſame as long as they ſhall behave themſelves well. It is ſaid, that theſe words intend what the law would imply, if an office were granted during life.

QUAMSI, a province of China, bounded by the province of Yunan on the weſt, by Queycheu on the north, by Quamtum on the eaſt, and by Tonquin on the ſouth.

QUAMTUM, or CANTON, a province of China, bounded by Huguam and Kiamſi on the north, by Foken on the eaſt, by the ocean on the ſouth, and by Quamſi on the weſt.

QUANTITY, *quantitas*, any thing capable of eſtimation, or menſuration; or which, being compared with another thing of the ſame kind, may be ſaid to be greater or leſs than it, equal or unequal to it.

Mathematics is the ſcience or doctrine of quantity, which being made up of parts, is capable of being made greater or leſs. It is increaſed by addition, and diminiſhed by ſubſtraction; which are therefore the two primary operations that relate to quantity. Hence it is that any quantity may be ſuppoſed to enter into algebraic computations two different ways, which have contrary effects, *viz.* either as an increment or as a decrement. See the articles ADDITION and SUBSTRACTION.

As addition and ſubſtraction are oppoſite, or an increment is oppoſite to a decrement, there is an analogous oppoſition between the affections of quantities that are conſidered in the mathematical ſciences; as between exceſs and defect, between the value of effects or money due to a man, and money due by him; a line drawn towards the right, and a line drawn towards the left; gravity, and levity; elevation above the horizon, and depreſſion below it. When two quantities equal in reſpect of magnitude, but of thoſe oppoſite kinds, are joined together, and conceived to take place in the ſame ſubject, they deſtroy each other's effect, and their amount is nothing. A power is ſuſtained by an equal power, acting on the ſame body with a contrary direction, and neither have effect. When two unequal quantities of thoſe oppoſite qualities are joined in the ſame ſubject, the greater prevails by their difference; and when a greater quantity is taken from a leſſer of the ſame kind, the remainder becomes of the oppoſite kind. When two powers or forces are to be added together, their ſum acts upon the body; but when we are to ſubſtract one of them from the other, we conceive that which is to be ſubſtracted, to be a power with an oppoſite direction; and if it be greater than the other, it will prevail by the difference. This change of quality only takes place where the quantity is of ſuch a nature as to admit of ſuch a contrariety or oppoſition. We know nothing analogous to it in quantity abſtractly conſidered, and cannot ſubſtract a greater quantity of matter from a leſſer, or a greater quantity of light from a leſſer; and the application of this doctrine to any art or ſcience, is to be derived from the known principles of the ſcience. See the articles ALGEBRA, GEOMETRY, *&c.*

A quantity that is to be added, is called a poſitive quantity; and a quantity to be ſubſtracted, is ſaid to be negative. See POSITIVE and NEGATIVE.

Quantities are ſaid to be like or ſimilar, that are of the ſame denomination, or are repreſented by the ſame letter or letters, equally repeated: but quantities of different denominations, or repreſented by a different letter or letters, are ſaid to be unlike or diſſimilar. A quantity conſiſting of more than one term is called a compound quantity; whereas that conſiſting of one term only is denominated a ſimple quantity.

The quantity of matter in any body, is the product of its denſity into its bulk; or a quantity ariſing from the joint conſideration of its magnitude and denſity; as if a body be twice as denſe, and take up twice as much ſpace as another, it will be four times as great. This quantity of matter is beſt diſcoverable by the abſolute weight of bodies. See GRAVITY.

The quantity of motion in any body is the factum of the velocity into the maſs, or it is a meaſure ariſing from the joint conſideration of the quantity of matter, and the velocity of the motion of the body; the motion of any whole being the ſum or aggregate of the motion in all its ſeveral parts. Hence, in a body twice as great as another, moved with an equal velocity, the quantity of motion is double; if the velocity be double alſo, the quantity of motion will be quadruple. Hence, the quantity of motion is the ſame with what we call the momentum or impetus

petus of a moving body. See MOTION.

Combination of QUANTITIES. See the article COMBINATION.

Commenſurable QUANTITIES. See the article COMMENSURABLE.

Exponential QUANTITY. See the article EXPONENTIAL.

Infinite QUANTITIES. See INFINITE QUANTITIES and INFINITESIMALS.

Tranſcendental QUANTITIES. See the article TRANSCENDENTAL.

Variable QUANTITIES. See VARIABLE.

QUANTITY, in grammar, an affection of a ſyllable, whereby its meaſure, or the time wherein it is pronounced, is aſcertained; or that which detetrmines the ſyllable to be long or ſhort. See the articles MEASURE and SYLLABLE.

Quantity is alſo the object of proſody, and diſtinguiſhes verſe from proſe; and the œconomy and arrangement of quantities, that is, the diſtribution of long and ſhort ſyllables, make what we call the number. See PROSODY, VERSE, and NUMBER.

The quantities are uſed to be diſtinguiſhed, among grammarians, by the characters ⏑, ſhort, as pĕr; and —, long, as rōs. There is alſo a common, variable, or dubious quantity; that is, ſyllables that are one time taken for ſhort ones, and at another time for long ones as the firſt ſyllable in *Atlas*, *patres*, &c. Feet are made up of quantities. See FOOT.

The quantity of a ſyllable is either natural or accidental: natural quantity is that taken from the nature of the vowel, as *re* in *reſiſto* is ſhort, and *de* in *depello*, is long. Accidental quantity is that departing from the natural quantity, merely by accident, as *re* in *reſtiti* is long, becauſe it is immediately followed by two conſonants; and *de* in *deamo* is ſhort, becauſe it immediately precedes a vowel.

The quantity of ſyllables is known two ways. 1. By rules for that purpoſe. And, 2. By authority. The rules for this end are taught by that part of grammar called proſody; the authority made uſe of in this caſe is no more than examples from, or the teſtimony of, approved authors; and is never uſed but either when the rules are deficient, or when we are unacquainted with them. The quantity of the ſyllables is but little fixed in the modern tongues; and there is ſtill leſs regard had to it in the compoſition of modern verſes. The want of feet, or rather the ſhortneſs and uniformity of our feet, makes a world of difference between the numbers of the antient and modern verſe. The antients ſubſiſted by their quantities alone; ſo well were they diſtinguiſhed, and ſuch a harmony did they produce. Our quantities make ſuch poor muſic, that we are generally forced to call in the gothic aid of rhyme, to diſtinguiſh our verſe from proſe.

QUANTITY *of a degree*. See DEGREE.

QUANTUM MERUIT, in law, is an action upon the caſe, founded on the neceſſity of paying a perſon, for doing any thing as he deſerves.

QUARANTAIN, QUARENTINE, or QUARANTENA, in old law books, denotes the ſpace of forty days. It alſo ſignifies a benefit allowed to the widow of a man dying ſeiſed of lands, &c. by which ſhe may challenge to continue in his capital meſſuage, or chief manſion-houſe, ſo it be not a caſtle, for the ſpace of forty days after his deceaſe. And if the heir or any other perſon eject her, ſhe may have the writ de quarantena habenda.

QUARANTAIN is more particularly uſed for a term of forty days, which veſſels, coming from places ſuſpected of contagion, are obliged to wait in certain places appointed to air themſelves, before they come into port. See the article LAZAR-HOUSE.

Quarantain, alſo ſignifies a meaſure or extent of land, containing forty perches.

QUARANTAIN *of the king*, in France, denotes a truce of forty days appointed by St. Louis, during which it was expreſly forbid to take revenge on the relations or friends of people, who had fought, wounded, or affronted each other in words.

QUARE, in law, a term affixed to the title of ſeveral writs: as 1. Quare ejecit infra terminum, is a writ that lies for a leſſee caſt out of his farm before his term is expired. 2. Quare impedit, a writ that lies for a perſon that has purchaſed an advowſon, againſt him who diſturbs him in the right thereof, by preſenting a clerk to it when the church is vacant. This writ differs from what is called a darrein preſentment, becauſe that is brought where a perſon or his anceſtors formerly preſented; but this lies for him that is purchaſer himſelf. Yet in both theſe writs, the plaintiff recovers the preſentation and damages; though the title to the advowſon is recovered only by a quare impedit. 3. Quare incumbravit is a writ that lies againſt a biſhop, who within ſix months after the vacancy of a benefice, confers it on his clerk, while two others are conteſting the right of preſentation. 4. Quare non admiſit, is a writ that lies where any one has recovered an advow-

ſon

ſon or preſentation, and ſending his clerk to be admitted, the biſhop refuſes to admit him: in which caſe the perſon that has the preſentation may have this writ againſt the biſhop. 5. Quare non permittit, is a writ that lies for one who has a right to preſent for a turn againſt the proprietary. 6. Quare obſtruxit, is a writ that lies for him who having a right to paſs through another's grounds cannot enjoy the ſame, by reaſon the owner has fenced them up.

QUARREL, *querela*, in law, is generally applied to perſonal and mixed actions, in which the plaintiff is called querens: and hence it is that if a perſon releaſe all quarrels, it is taken to be as beneficial to the releaſee, as if it were a releaſe of all actions; ſince all actions both real and perſonal are thereby releaſed.

QUARREL *of glaſs*. See the next article.

QUARRY, a place under ground, out of which are got marble, free-ſtone, ſlate, lime-ſtone, or other matters proper for buildings.

Quarries of free ſtone, are in many places opened, and the ſtone brought out, in the following manner: they firſt dig a hole in the manner of a well, twelve or fourteen feet in diameter, and the rubbiſh drawn out with a windlaſs in large oſier baſkets, they heap up all around; placing their wheel, which is to draw up their ſtones, upon it. As the hole advances, and their common ladder becomes too ſhort, they apply a particular ladder for the purpoſe. When they have got thro' the earth, and are arrived at the firſt bank or ſtratum; they begin to apply their wheel and baſkets to diſcharge the ſtones as faſt as they dig through them. In freeing the ſtone from the bed, they proceed thus: as common ſtones, at leaſt the ſofter kinds, have two grains, a cleaving grain, running parallel with the horizon, and a breaking grain, running perpendicular thereto; they obſerve by the grain where it will cleave, and there drive in a number of wedges, till they have cleft it from the reſt of the rock. This done, they proceed to break it; in order to which applying the ruler to it, they ſtrike a line, and by this cut a little channel with their ſtone-ax; and in the channel if the ſtone be three or four feet long, ſet five of ſix wedges, driving them in very carefully with gentle blows, and ſtill keeping them equally forward. Having thus broken the ſtone in length, which they are able to do of any ſize within half an inch, they apply a ſquare to the ſtrait ſide, ſtrike a line, and proceed to break it in breadth. This way of managing ſtone is found vaſtly preferable to that where they are broken at random: one load of the former being found to do the buſineſs of a load and a half of the latter. But it may be obſerved, that this cleaving grain being generally wanting in the harder kinds of ſtones, to break up theſe in the quarries, they have great heavy ſtone-axes; with which they work down a deep channel into the ſtone; and into this channel, at the top, lay two iron-bars between which they drive their iron wedges.

QUARRY or QUARREL, among glaziers; a pane of glaſs cut in a diamond form.

Quarries are of two kinds, ſquare and long, each of which are of different ſizes, expreſſed by the number of the pieces that make a foot of glaſs, *viz.* eighths, tenths, twelfths, eighteenths, and twentieths: but all the ſizes are cut to the ſame angles, the acute angle in the ſquare quarrels being 77° 19′ and 67° 21′ in the long ones.

QUARRY, among hunters, is ſometimes uſed for a part of the intrails of the beaſt taken, given by way of reward to the hounds.

QUARRY, in falconry, the game which the hawk is in purſuit of, or has killed,

QUART, a meaſure containing the fourth part of ſome other meaſure. See the article MEASURE.

The engliſh quart is the fourth part of a gallon, or two pints. See the articles GALLON and PINT.

QUARTAN, *quartana*, in medicine, a ſpecies of intermitting fever, wherein the patient has two fits in four days, or two days quite free from a fit.

It uſually begins about four or five in the afternoon, ſometimes ſooner and ſometimes later, with a great laſſitude, ſtretching, a blunt pain in the head, back, loins, and legs; the feet and hands are cold, and the whole body is pale; and the face and nails livid, to which ſhivering and ſhaking ſupervene. The tongue and the lips tremble, the breathing is difficult, with reſtleſſneſs, and toſſing; the pulſe is contracted and hard, and ſometimes unequal; and there is an anxiety about the præcordia. Theſe ſymptoms continue about two or three hours; and in ſome the body is coſtive, whereas in others there is a ſtimulus to ſtool, and to make water; in ſome again, there is a nauſea or vomiting, with ſtools; and ſome advanced in years, have their minds pretty much diſturbed. The

heat

heat comes on gradually, not burning but dry; the pulſe becomes equal, quick, and large, but the dull pain in the head remains, with a vertiginous affection; the ſkin becomes only a little moiſt; and and in about four or ſix hours, the ſymptoms vaniſh except a dull pain in the bones, joints, and feet. The urine in the fit is ſometimes thin and watery, and ſometimes thick with a ſediment.

From the experiments of Dr. Langriſh it appears, that the blood is more denſe and tenacious in quotidians than in tertians, and in tertians than in quartans. See QUOTIDIAN and TERTIAN.

As to the cure, a vomit ſhould be given after the firſt fit, in the time of intermiſſion: in tender conſtitutions, ipecacuanha may be given alone, or two ounces of vinum ipecacuanhum; but to the more robuſt, a grain or two of emetic tartar may be added, to be taken in warm water about two hours after the paroxyſm. The evacuation ſhould be facilitated by taking large draughts of water-gruel made fat with freſh butter. Then take the following electuary, which will cruſh the diſeaſe in the bud: *viz.* take of rob of elder, one ounce; of peruvian bark, five drams; of the powder of common chamomile-flowers, two drams; of the extract of leſſer centaury, and powder of clove-julyflowers, each half a dram; and as much ſyrup of lemons as is ſufficient to reduce them to the form of an electuary. The doſe is half a dram, to be taken every two hours after the fit.

If any thing forbids vomiting, the cure muſt be begun with deterſive and aperient ſalts, as vitriolated tartar, ſalt ammoniac, purified nitre, and crab's eyes; and if the ague ſtill continue notwithſtanding the repeated uſe of theſe ſalts, then an equal weight of peruvian bark muſt be added to them, or the above electuary may be given.

When the patient is ſubject to the hypochondriac paſſion, the ſtomach is inflated, and the body coſtive; then neither vomits nor ſalts muſt be ventured upon, but carminative and emollient clyſters.

In obſtinate quartans, Hoffman greatly commends the following medicine: take of peruvian bark, three drams; of medicinal regulus of antimony, two drams; of mercurius dulcis, which is not to be triturated with the powder, on account of the ſalts, but only mixed with the point of a knife) of the fineſt crocus martis, and of vitriolated nitre, each one dram; and of oil of mint, four drops: make up all theſe into a powder, of which half a dram, or a dram, may be taken, made into the form of a bolus with rob of elder, and ſyrup of clove-julyflowers.

This method is confirmed by Huxham, who ſays the bark frequently proves ineffectual, without the help of proper alexipharmics; as ſnake-root of Virginia, contrayerva, myrrh, camphor, *&c.* After four or five paroxyſms, warm chalybeates may be added with very great ſucceſs; but when the patient's complexion has a yellow caſt, and he has a tenſe abdomen, and very coſtive habit of body, mercurial, ſaponaceous deobſtruents with rhubarb, aloetics, or ſal diureticus ſhould be premiſed to, or joined with the bark. Hoffman obſerves, that obſtinate quartans in boys are not to be cured but by purging; and therefore he directs the following form: take of cream of tartar, one dram; of calyx of antimony, twelve grains, of ſulphurated diagrydium, ſix grains; make them into a powder, which may be taken in three doſes, the firſt ſix hours before the fit, the ſecond before the next fit, and the third before the third fit. After this, he orders an infuſion of half an ounce of peruvian-bark in eight ounces of fennel water; adding the bark of Eleutherius, ſal diureticus, and ſalt of tartar, of each one dram, together with half an ounce of ſyrup of clove-julyflowers; a ſpoonful of which ſhould be taken every two hours.

To prevent the return of an ague, the bark muſt be repeated every week or ten days, for three ſeveral times, with the ſame intervals. Likewiſe bitters and chalybeates are very ſerviceable, taken either together or ſeparately.

QUARTATION, in metallurgy, a method of purifying gold, by melting three parts of ſilver with one of gold, and then throwing the mixture into aqua-fortis. See the article ASSAYING.

Experience has taught us, ſays Cramer, that aqua-fortis diſſolves ſilver mixed with gold quickly enough, when the gold conſtitutes but one, and the ſilver three parts of a mixed maſs of them: and in this caſe, if the ſolution is not too impetuouſly performed, the gold uſually remains in ſuch a proportion, in the ſame figure that the whole maſs had before the ſeparation of the ſilver by this menſtruum; ſo that in this caſe, there is no reaſon to apprehend the gold's being torn into minute particles, and diſſipated in ſome meaſure; though this can hardly be prevented when the ſilver exceeds the

three

three quarter proportion, in regard to the gold in the mass. The artificers therefore, always make it their study to observe very exactly this proportion of the gold being one fourth part of the mixture; and thence it is that the operation itself has been called quartation. From this operation we may learn how fallacious the examination made with aqua fortis alone of the gold rubbed on the touchstone, must necessarily prove.

QUARTER, *quadrans*, the fourth part of any thing, the fractional expression for which is ¼. See the article FRACTION.

Quarter, in weights, is generally used for the fourth part of an hundred weight averdupois, or 28 lb. See WEIGHT.

Used as the name of a dry measure, quarter is the fourth part of a ton in weight, or eight bushels. See the articles MEASURE and TUN.

QUARTER, in law, the fourth part of a year; and hence the days on which these quarters commence, are called quarter-days *viz.* March 25, or Lady-day; June 24, or Midsummer-day; September 29, or Michaelmas; and December 21, or St. Thomas the apostle's day. On these days rents on leases, *&c.* are usually reserved to be paid; though December 25, or Christmas-day, is commonly reckoned the last quarter-day.

QUARTER, in astronomy, the fourth part of the moon's period: thus, from the new moon to the quadrature is the first quarter; from this to full moon, the second quarter, *&c.* See the article PHASIS and MOON.

QUARTER, in heraldry, is applied to the parts or members of the first division of a coat that is quartered, or divided into four quarters. See QUARTERING.

Franc-QUARTER, in heraldry, is a quarter single or alone; which is to possess one fourth part of the field.

This makes one of the honourable ordinaries of a coat.

QUARTER *of a point*, in navigation, is the fourth part of the distance between two cardinal points, which 2° 48′.

QUARTER of a ship is that part of a ship's hold, which lies between the steerage-room and the transom.

Close QUARTERS, in a ship, those places where the seamen quarter themselves, in case of boarding, for their own defence, and for clearing the decks, *&c.*

QUARTER-DECK. See DECK.

QUARTER-MASTERS, or QUARTEERS, in a man of war, are officers whose business it is to rummage, stow, and trim the ship in the hold; to overlook the steward in his delivery of victuals to the cook, and in pumping or drawing out beer, or the like. They are also to keep their watch duly, in conning the ship, or any other duty.

QUARTER is also used for a division of a city, consisting of several ranges of buildings, *&c.* separated from some other quarter by a river, great street, *&c.*

Such are the twenty quarters of the city of Paris.

Franchise of QUARTERS. See the article FRANCHISE.

QUARTER, in war, is used in various senses, as for the place allotted to a body of troops to encamp upon: thus they say, the general has extended his quarters a great way, *&c.* Quarter also signifies the sparing men's lives: thus it is said, the enemy asked quarter; we gave no quarter.

QUARTER *of an assembly*, is the place of rendezvous, where the troops are to meet, and draw up in a body.

Head QUARTERS, is the place where the general of an army has his quarters, which is generally near the center of the army.

QUARTERS *of refreshment*, is the place to which the troops that have been much fatigued are sent to refresh themselves during a part of the campaign.

Winter QUARTERS, the places in which the troops are lodged during the winter, or their residence in those places.

QUARTER-MASTER, an officer in the army, whose business is to look after the quarters of the soldiers; of which there are several kinds, *viz.* The quarter-master general, whose business is to provide good quarters for the whole army. Quarter-master of horse, he who is to provide quarters for a troop of horse. Quarter-master of foot, he who is to provide quarters for a regiment of foot.

QUARTER, in the manege, as to work from quarter to quarter, is to ride a horse three times in upon the first of the four lines of a square; then changing your hand, to ride him three times upon the second; and so to third and fourth; always changing hands and observing the same order.

QUARTERS, with respect to the parts of a horse, is used in various senses: thus the shoulders and fore-legs, are called the fore-quarters, and the hips and hinder-legs, the hind-quarters. The quarters of a horse's foot, are the sides of the coffin, comprehending between the toe and the heel; the inner quarters, are

thoſe oppoſite to one another, facing from one foot to the other; and theſe are always weaker than the outſide quarters, which lie on the external ſides of the coffin. Falſe quarters, are a cleft in the horn of a horſe's hoof, extending from the coronet to the ſhoe. A horſe is ſaid to be quarter-caſt, when for any diſorder in the coffin we are obliged to to cut one of the quarters of the hoof.

QUARTERS *of a ſaddle*, are the pieces of leather or ſtuff made faſt to the lower part of the ſides of a ſaddle, and hanging down below it.

QUARTERS, in a clock, are the little bells that ſound the quarters in an hour.

QUARTER-CHORD, in mining, is ſeven yards and a quarter, which the miner has croſs-ways of his vein, on either ſide, for liberty to lay his earth, ſtones, and rubbiſh on, and to waſh and dreſs up his ore.

QUARTERS, in building, are thoſe ſlight upright pieces of timber placed between the puncheons and poſts, uſed to lath upon. Theſe are of two ſorts, ſingle and double; the ſingle quarters are ſawn to two inches thick, and four inches broad; the double quarters are ſawn to four inches ſquare. It is a rule in carpentry, that no quarters be placed at a greater diſtance than fourteen inches.

QUARTER-ROUND, in architecture, is a term uſed by the workmen for any projecting moulding in general, whoſe contour is a perfect quadrant of a circle, or which approaches near that figure.

QUARTER-SESSIONS, a general court held quarterly by the juſtices of peace of each county. See JUSTICES *of peace*.

QUARTER-STAFF, a long ſtaff borne by foreſters, park-keepers, &c. as a badge of their office; and occaſionally uſed as a weapon.

QUARTER-WHEELING, or QUARTER *of converſion*, in the military art, is the motion by which the front of a body of men is turned round to where the flank was, by taking a quarter of a circle. If it be done to the right, the man in the right-hand angle keeps his ground and faces about, while the reſt wheel; if to the left, the left hand man keeps his place.

QUARTER-WIND, at ſea, is a lateral or ſide-wind, which does not blow in ſtern, but a little aſide of it.

This is the beſt of all winds, as bearing into all the ſails; whereas a wind blowing full in ſtern, is kept off by the ſails of the mizzen.

QUARTERING, in the ſea-language, is diſpoſing the ſhip's company at an engagement, in ſuch a manner as that each may readily know where his ſtation is, and what he is to do. As ſome to the maſter, for the management of the ſails; ſome to aſſiſt the gunners in traverſing the ordnance; ſome for plying of the ſmall ſhot; ſome to fill powder in the powder-room; others to carry it from thence to the gunners, in cartridges, &c.

When a ſhip under ſail goes at large neither by wind, nor before a wind, but, as it were betwixt both, ſhe is ſaid to go quartering.

QUARTERING, in gunnery, is when a piece of ordnance is ſo traverſed that it will ſhoot on the ſame line, or on the ſame point of the compaſs as the ſhip's quarter bears.

QUARTERING, in heraldry, is dividing a coat into four or more quarters, or quarterings, by parting, couping, &c. that is by perpendicular and horizontal lines, &c. Columbiere reckons twelve ſorts of quarterings, *viz.* party per pale, dividing the eſcutcheon from top to bottom; party per croſs, dividing it from ſide to ſide; party of ſix pieces, when the eſcutcheon is divided into ſix parts; party of ten; of twelve; of ſixteen; of twenty; and of thirty-two, when there are ſo many partitions. Others give the diviſions in another manner: as party per croſs; per pale; per chief; per pale inclave; per bend dexter; per bend ſiniſter; per chevron; barry bendy of eight pieces; paleways of ſix pieces; barry of ſix pieces; barry of eight pieces; bendy of ſix; checky; fuſilly, or lozengy; bendy lozengy; barry bendy lozengy, or bend lozengy; gyronny; barry lozengy counterchanged; waved of ſix pieces; barry nebule of ſix pieces; party per pale, and party per pale in point. See each of which under their reſpective articles.

Quartering is alſo applied to the partitions or compartments themſelves; that is, to the ſeveral coats borne on an eſcutcheon, or the ſeveral diviſions made in it, when the arms of ſeveral families are placed on the ſame ſhield, on account of intermarriages, or the like.

Quartering is alſo uſed for diſtinguiſhing younger brothers from the elder.

In blazoning, when the quartering is performed per croſs, the two quarters a-top are numbered the firſt and ſecond; and thoſe at bottom, the third and fourth; beginning to tell on the right ſide. When the quartering is by a ſaltier, &c. the chief and point are the firſt and ſecond quarters, the right ſide the third, and the

left

left the fourth. See pl. CCXXV. fig. 2.

Counter-QUARTERING *a coat*, is when the quarters are ſubdivided each into four.

There are counter-quartered coats that have twenty or twenty-five quarters.

QUARTERING, or QUARTERIZATION, is part of the puniſhment of a traitor, which conſiſts of dividing his body into four quarters.

QUARTERLY, in heraldry. A perſon is ſaid to bear quarterly, when he bears arms quartered. See QUARTERING.

QUARTERN, a diminitive of quart, ſignifying a quarter of a pint. See the article MEASURE.

QUARTILE, an aſpect of the planets. See the article ASPECT.

QUARTO, or 4to, a book of which four leaves, or eight pages make a ſheet.

QUARTO-DECIMANS, *quarto-decimani*, an antient chriſtian ſect, ſo called from their maintaining that the feſtival of Eaſter ought to be celebrated, conformably to the cuſtom of the Jews, on the fourteenth day of moon in the month of March, whatever day of the month that happened to be.

QUASHING, in law, the overthrowing and annulling of any thing.

QUASI CONTRACT, in the civil law, an act which has not the ſtrict form of a contract, but yet has the force of one.

Thus if one perſon does another's buſineſs in his abſence, without his procuration, and it has ſucceeded to the other perſon's advantage; the one may have an action for what he has diſburſed, and the other to make him give an account of his adminiſtration: which amounts to a quaſi-contract.

QUASI-CRIME, or QUASI-DELICT, in the civil law, is the act of doing a perſon an injury, involuntarily; which is to be repaired by making good the damage with intereſt.

QUASI MODO SUNDAY, or LOW EASTER SUNDAY, the next Sunday after Eaſter: ſo called from the beginning of the introit of the maſs for the day, *quaſi modo geniti infantes*.

QUATER-COUSINS, fourth couſins, or the laſt degree of kindred.

QUATRE-NATIONS, four nations, the name of a college founded by cardinal Mazarin, for the education and maintenance of ſixty children natives of the four countries conquered by the king, *viz.* Pignerol, Alſatia, Flanders, and Rouſſillon.

QUATUOR VIR, in antiquity, formerly written IIII. VIR, a roman magiſtrate who had three colleges joined with him in the ſame adminiſtration, and had the care of conducting and ſettling the colonies ſent into the provinces.

There were alſo quatuor-viri appointed to inſpect and take care of repairs, *&c.*

QUAVER, in muſic, a meaſure of time equal to half a crotchet, or an eighth of a ſemibreve.

The quaver is divided into two ſemiquavers, and four demiſemiquavers. See the article CHARACTERS *in muſic*.

QUAVERING, in muſic, trilling or ſhaking; or the running a diviſion with the voice.

QUAY, or KAY. See the article WHARF.

QUEBEC, the capital of Canada, in North America, ſituated on the weſt ſide of the river of St. Lawrence, 300 miles north-weſt of Boſton in New England: weſt long. 74°, north lat. 47° 5′.°

QUEEN, *regina*, a woman who holds a crown ſingly.

The title of queen is alſo given by way of courteſy to her that is married to a king, who is called by way of diſtinction queen-conſort; the former being termed queen-regent. The widow of a king is alſo called queen; but with the addition of dowager.

A queen-regent is in the conſtruction of law the ſame with a king, and has the ſame power in all reſpects. See KING.

A queen-conſort is inferior to the king, and is really his ſubject, though, as the king's wife, ſhe has ſeveral prerogatives above other women. Though an alien, ſhe may purchaſe lands in fee-ſimple, without either naturalization or denization. She may preſent to a benefice. She ſhall not be amerced if ſhe be nonſuited in any action; and may not be impleaded till firſt petitioned. To conſpire her death, or violate her chaſtity, is high treaſon. She has an antient peculiar revenue called queen-gold; beſides a very large dower, with a royal court, and officers of her own. No perſon here muſt marry a queen-dowager without the licence of the ſucceeding king, on pain of forfeiting his lands and goods: but tho' ſhe marry any of the nobility, or even one under that degree, ſhe does not loſe her dignity.

QUEEN'S COUNTY, a county of Ireland, bounded by King's county, on the north; by Kildare, on the eaſt; by Kilkenny, on the ſouth; and by the province of Munſter, on the weſt.

QUEEN'S FERRY, a town of Scotland, on the

the ſouth ſide of the river Forth, ten miles weſt of Edinburgh.

QUEEN'S GOLD, a royal revenue that belongs to the queen of England, during her marriage to the king, and payable by divers perſons upon ſeveral grants of the king, by way of oblation, out of fines amounting to ten marks, or upwards, *viz.* one tenth part above the intire fine, or ten pounds for every hundred pounds fine, on pardons, contracts, or agreements; which become a real debt to the queen, on the party's bare agreement with the king for his fine, and recording it, without any farther promiſe or contract.

QUEENBOROUGH, a borough town of the iſle of Sheppy, in Kent, twelve miles north-weſt of Canterbury.

It ſends two members to parliament.

QUE-ESTATE, in law, a plea whereby a man intitling himſelf to land, &c. ſays, that the ſame eſtate which another had, he now has from him.

QUE EST MEME, in law, is a term uſed in actions of treſpaſs, &c. for a direct and poſitive juſtification of the very act complained of by the plaintiff.

QUERCUS, the OAKTREE, in botany. See the article OAK.

QUERCY, the ſouth-eaſt diviſion of the province of Guienne, in France, having Limoſin on the north, and Languedoc on the ſouth.

QUERELA, in law, an action or complaint exhibited in any court of juſtice. See the article QUARREL.

QUERELA AUDITA. See the article AUDITA QUERELA.

QUERELA CORAM REGE ET CONCILIO, is a writ by which a perſon is called to juſtify a complaint of a treſpaſs made to the king himſelf, before the king and his council.

QUERIA, in botany, a genus of the triandria trigynia claſs of plants; the calyx of which is an erect, five leafed perianthium: it has no corolla; the fruit is a roundiſh capſule, conſiſting of three valves, and containing only one cell; the ſeed is ſingle.

QUERRIES, or EQUERRIES. See the article EQUERRY.

Gentleman of the QUERRY, an officer appointed to hold the king's ſtirrup, when he mounts on horſeback.

QUEST, or INQUEST, an inquiry upon the oaths of an impannelled jury. See the article INQUEST.

QUEST, in hunting, the ſeeking out of hounds, or the venting or winding of ſpaniels.

QUESTION, *queſtio*, in logic, a propoſition propoſed by way of interrogation. See the article PROPOSITION.

QUESTOR, or QUÆSTOR, in roman antiquity, an officer who had the management of the public treaſure.

The queſtorſhip was the firſt office any perſon could bear in the commonwealth, and gave a right to ſit in the ſenate.

At firſt there were only two; but afterwards two others were created, to take care of the payment of the armies abroad, of the ſelling plunder, booty, &c. for which purpoſe they generally accompanied the conſuls in their expeditions; on which account they were called peregrini, as the firſt and principal two were called urbani.

The number of queſtors was afterwards greatly increaſed. They had the keeping the decrees of the ſenate: and hence came the two offices of queſtor principis, or auguſti, ſometimes called candidatus principis, whoſe office reſembled in moſt reſpects that of our ſecretaries of ſtate; and the quæſtor palatii, anſwering in a great meaſure to our lord chancellor.

QUEUE, in heraldry, ſignifies the tail of a beaſt: thus if a lion be borne with a forked tail, he is blazoned doubled queued.

QUEUE D'ARONDE, or SWALLOW'S TAIL, in fortification, an out-work which is narrower at the gorge than at the front or face, being ſo called from its reſemblance to a ſwallow's tail.

Of this kind are ſome ſingle as well as double tenailles, and ſome horn-works whoſe ſides are not parallel. See the articles TENAILLE and HORN-WORK.

When the front is narrower than the gorge, the work is denominated a contre queue d'aronde.

In carpentry, a queue d'aronde is more generally known by the name of dove-tail. See the article DOVE-TAILING.

QUIA IMPROVIDE, in law, a ſuperſedeas iſſued on the behalf of a clerk of the court of chancery, ſued contrary to the privilege of that court in the common pleas, and proſecuted to the exigent; and in ſeveral other caſes, where a writ is erroneouſly ſued.

QUICK, or QUICKSET HEDGE, among gardeners, denotes all live hedges, of whatever ſort of plants they are compoſed, to diſtinguiſh them from dead hedges: but in a more ſtrict ſenſe of the word, it is reſtrained to thoſe planted with the hawthorn, or meſpilus ſylveſtris; under which name theſe young plants, or ſets, are ſold by the nurſery-gardeners

who

who raiſe them for ſale. See HEDGE.

QUICK BEAM, *ſorbus ſylveſtris*. See the article SORBUS.

QUICK-SILVER, in natural hiſtory, a ponderous mineral fluid, more uſually called mercury. See the article MERCURY.

QUID, a term uſed in the ſchools for the definition of a thing; which is thus called, as anſwering to the queſtion, *quid eſt?* what is it. See DEFINITION.

QUID JURIS CLAMAT, in law, a judicial writ which iſſues out of the record of a fine that remains with the cuſtos brevium, before the ſame is engroſſed; and it lies for the grantee of a reverſion or remainder, where the particular tenant will not attorn.

QUID PRO QUO, in law, is the mutual conſideration and reciprocal performance of both parties to a contract; as the giving one thing of value, for another of the like; and whatever contract is contrary thereto, the law terms it nudum pactum.

QUID PRO QUO is alſo uſed, in a phyſical ſenſe, to expreſs a miſtake of an apothecary, in adminiſtring one medicine for another; or in uſing a different ingredient in a compoſition from that preſcribed. See the article PRESCRIPTION.

QUIDDANY, or QUIDDENY, in pharmacy, conſerve of quinces. See the articles QUINCE and MARMALADE.

QUIDDITY, *quidditas*, a barbarous term uſed in the ſchools for eſſence. See the articles ESSENCE and DEFINITION.

And hence what is eſſential to a thing, is ſaid to be quiddative.

QUIETARE, in law, a term frequently met with in old deeds and conveyances, ſignifying to acquit, releaſe, or diſcharge. See the article QUIETUS.

QUIETISTS, a religious ſect, which made a great noiſe towards the cloſe of the laſt century.

They were ſo called from a kind of abſolute reſt and inaction, which they ſuppoſed the ſoul to be in when arrived at that ſtate of perfection which they called the unitive life; in which ſtate, they imagined the ſoul wholly employed in contemplating its God, to whoſe influence it was entirely ſubmiſſive, ſo that he could turn and drive it where and how he would. In this ſtate, the ſoul no longer needs prayers, hymns, &c. being laid, as it were, in the boſom, and between the arms of its God, in whom it is in a manner ſwallowed up.

The mahometans ſeem to be no ſtrangers to quietiſm. They expound a paſſage in the ſeventieth chapter of the Koran, viz. *O thou ſoul, which art at reſt, return unto thy Lord*, &c. of a ſoul, which having, by purſuing the concatenation of natural cauſes, raiſed itſelf to the knowledge of that being which produced them, and exiſts of neceſſity, reſts fully contented, and acquieſces in the knowledge, &c. of him, and in the contemplation of his perfections.

QUIETUS, in law, is the ſame as freed or acquitted; being uſed by the clerk of the pipe, and auditors in the exchequer, in their diſcharges given to accounts; which generelly conclude with theſe words, *abinde receſſit quietus*, and is termed a *quietus eſt*; and being granted to a ſheriff, diſcharges him of all accounts and demands due to the king.

QUILLS, the large feathers taken out of the end of the wing of a goeſe, crow, &c.

Quills are denominated from the order in which they are fixed in the wing, the ſecond and third quills being the beſt for writing, as they have the largeſt and roundeſt barrels.

Crow-quills are chiefly uſed for drawing. In order to harden a quill that is ſoft, thruſt the barrel into hot aſhes, ſtirring it till it is ſoft, then taking it out, preſs it almoſt flat upon your knee with the back of a penknife, and afterwards reduce it to a roundneſs with your fingers. If you have a number to harden, ſet water and alum over the fire, and while it is boiling put in a handful of quills, the barrels only, for a minute, and then lay them by.

QUILT, a covering for a bed, formed of two pieces of ſilk, cotton, &c. quilted together.

QUILTING, a method of ſewing two pieces of ſilk, linen, or ſtuff on each other, with wool or cotton between them; by working them all over in the form of chequer or diamond-work, or in flowers. The ſame name is alſo given to the ſtuff ſo worked.

QUINARIUS, in roman antiquity, a ſmall coin equal to half the denarius. See the article COIN and DENARIUS.

QUINCE, *cydonia*, in botany, is comprehended by Linnæus under pyrus. See the article PYRUS.

Quinces, on being imported, pay a duty of 1s. $6\frac{48}{100}$d. the hundred; and draw back, on exportation, 1s. $4\frac{70}{190}$d.

The ſyrup of quinces, prepared of their juice with ſugar, is an extremely pleaſant and cooling medicine. The fruit is alſo very delicious, but is rough and aſtringent when eaten raw: it is ſaid to coo and ſtrengthen the ſtomach, remove

naſeouſneſs, and ſtop fluxes of the belly.

QUINCUNX, in roman antiquity, denotes any thing that conſiſts of five twelfth parts of another, but particularly of the as. See the article UNCIA and AS.

QUINCUNX ORDER, in gardening, a plantation of trees, diſpoſed originally in a ſquare; and conſiſting of five trees, one at each corner, and a fifth in the middle: or a quincunox is the figure of a plantation of trees, diſpoſed in ſeveral rows, both length and breadthwiſe, in ſuch a manner, that the firſt tree in the ſecond row commences in the center of the ſquare formed by the two firſt trees in the firſt row, and the two firſt in the third, reſembling the figure of the five at cards. This diſpoſition of trees was formerly much more regarded than at preſent; but is ſtill much uſed in France, for planting trees to form a grove, and is expreſſed by the aſteriſks in plate CCXXV. fig. 3.

QUINCUNX, in aſtronomy, an aſpect of the planets, when 150° or five ſigns aſunder. See the article ASPECT.

QUINDECAGON, in geometry, a plain figure with fifteen ſides and fifteen angles; which, if the ſides be all equal, is termed a regular quindecagon, and irregular when otherwiſe.

The ſide of a regular quindecagon inſcribed in a circle, is equal in power to the half difference between the ſide of the equilateral triangle, and the ſide of the pentagon, inſcribed in the ſame circle; alſo the difference of the perpendiculars let fall on both ſides, taken together.

QUINDECEMVIRI, in roman antiquity, a college of 15 magiſtrates, whoſe buſineſs it was to preſide over the ſacrifices. They were alſo the interpreters of the Sibyl's books; which, however, they never conſulted but by an expreſs order of the ſenate.

QUINQUAGENARIUS, in roman antiquity, an officer who had the command of fifty men.

QUINQUAGESIMA SUNDAY, ſhrove Sunday, ſo called as being about the fiftieth day before Eaſter.

QUINQUATRIA, in roman antiquity, feſtivals celebrated in honour of Minerva, with much the ſame ceremonies as the panathenæa were at Athens. See PANATHENÆA and MINERVALIA.

QUINQUEFOLIUM, CINQUEFOIL, in botany, is comprehended by Linnæus under potentilla. See POTENTILLA.

QUINQUENNALIS, in roman antiquity, a magiſtrate in the colonies and municipal cities of that empire, who had much the ſame office as the ædile at Rome. See the article ÆDILE.

QUINQUEREMIS, in antiquity, a galley with five rows of oars. See GALLEY.

QUINQUEVIRI, in roman antiquity, an order of five prieſts, peculiarly appointed for the ſacrifices to the dead, or celebrating the rites of Erebus.

QUINQUINA, or QUINAQUINA, in pharmacy, the peruvian, or jeſuits-bark, or the bark of the tree called by Linnæus cinchona. See the article CINCHONA.

The peruvian bark ſhould be choſen freſh, and of a bright colour, approaching to that of cinnamon, and of a ſtrong taſte. The ſmaller pieces, in quills, are generally the beſt; the larger, and flatter fragments having leſs virtue. We ſometimes meet with it cut into thin ſlices, and of a yellower colour than ordinary: this is the bark of the root, has a very ſtrong taſte, and is eſteemed by the Spaniards the choiceſt of all.

The peruvian bark poſſeſſes the ſtomachic virtues of the other bitters, and that in ſo eminent a degree, that it is a queſtion whether any of the ſtomachics are equal to it: it ſtrengthens the ſtomach, promotes the appetite, and aſſiſts digeſtion; it diſſipates flatulencies, and is a very good medicine againſt worms. Its great virtue, however, is as a febrifuge: it cures all intermittents ſafely and ſpeedily, if properly given. Its febrifuge virtue was diſcovered to us by the Indians, among whom it had been many ages known, and firſt diſcovered by a perſon's being cured of an intermittent, by drinking the water of a pond, where ſome trees of it had accidentally fallen. It was not diſcovered to any body in this part of the world till 1640, when a Spaniard, the governor of the city of Loxa, who had behaved well to ſome of theſe people, had the diſcovery as a reward. With the new medicine he cured the viceroy's lady of a tertian, after ſhe had tried every thing elſe in vain. Hence it was called the counteſs's powder. After this, the jeſuits brought over a vaſt quantity, which was, in 1694, diſtributed all over Europe, and did great cures. It was then called pulvis patrum, and jeſuits-powder; and the cardinal de Lugo having bought up a vaſt quantity of it for the poor and others, it was afterwards called cardinal Lugo's powder.

QUINSEY, or QUINZY. See QUINZY.

QUINTAL, in commerce, the ſame with hundred-weight. See WEIGHT.

QUINTESSENCE, *quinta eſſentia*, in chemiſtry,

miſtry, a preparation conſiſting of the eſſential oil of ſome vegetable ſubſtance mixed and incorporated with ſpirit of wine: thus, on a proper quantity, *e. g.* of eſſential oil of fennel, pour twelve times the quantity of pure alcohol diſtilled from alcali, ſo as to contain not the leaſt water: ſhake them together, and the oil will diſappear, and intimately mix with the alcohol, ſo as to form one ſimple and tranſparent liquor. If ſuch quinteſſence be ſeveral times digeſted, cohobated, *&c.* with a gentle fire, the oil will at length be made ſo volatile as in great meaſure to riſe along with the alcohol: whence oils are rendered more moveable and more ſubtile, and are exhauſted to the higheſt degree of penetrability, like that of ſpirit, though ſtill retaining their native virtues: but if with a fire only of ninety degrees, a mixture of alcohol and theſe oils be diſtilled, the alcohol will riſe by itſelf, or only carry with it the preſiding ſpirit from the oil, leaving the oily part behind; and if with great caution the thinner part be ſeveral times ſeparated from the thicker, by repeated gentle cohobations, the alcohol will at length be ſo impregnated with thoſe ſpirits, as to appear almoſt pure ſpirit itſelf; leaving a groſs exhauſted oil behind.

Quinteſſences thus prepared have great medicinal virtues: thus if a ſingle drop of quinteſſence ſo made with oil of cinnamon, be mixed and drank with a glaſs of ſpaniſh-wine, it inſtantly gives a grateful briſkneſs to the flagging ſpirits, and therefore proves an admirable remedy in in faintings, ſuffocation, and want of ſpirits. All theſe preparations have a great affinity with fire; for being taken inwardly, they heat the body, and if the quantity be large, ſcorch and burn it: when applied externally they produce all the effects of a ſharp inflammation, *&c.* Dry quinteſſences may be made from the liquid ones; by adding to them ſome more eſſential oils of the ſame vegetable form whence the liquid quinteſſence was procured, with a little ſugar, all mixed together by a gentle heat, till all the moiſture is come over, the matter remaining then is a dry quinteſſence.

QUINTESSENCE, in alchemy, is a myſterious term, ſignifying the fifth, or laſt and higheſt eſſence, or power of a natural body.

QUINTILE, *quintilis*, in aſtronomy, an aſpect of the planets, when they are 72 degrees diſtant from one another, or a fifth part of the zodiac.

QUINTILIANS, a ſect of antient heretics, thus called from their propheteſs Quintilia. In this ſect the women were admitted to perform the ſacerdotal and epiſcopal functions. They attributed extraordinary gifts to Eve for having firſt eaten of the tree of knowledge; told great things of Mary the ſiſter of Moſes, as having been a propheteſs, *&c.* They added, that Philip the deacon had four daughters who were all propheteſſes and were of their ſect. In theſe aſſemblies it was uſual to ſee the virgins entering in white robes, perſonating propheteſſes.

QUINTIN, or St. QUINTIN, a town of Picardy, in France, 35 miles eaſt of Amiens.

QUINZY, QUINSEY, or ANGINA, in medicine, a pain and inflammation of the fauces, a ſwelling of the uvula, tonſils, and larynx, which being accompanied with a fever, occaſions a difficulty of reſpiration and deglutition. This diſeaſe generally prevails about the latter end of ſpring or beginning of ſummer. When the ſwelling pain and redneſs appear moſtly on the outſides, it is, according to Hoffman, the prognoſtic of a happy ſolution of the diſeaſe: but when the external ſwelling ſuddenly diſappears, without a mitigation of the ſymptoms, it ſhews the morbific matter to be tranſlated elſewhere, and that the diſeaſe will change to a phrenzy, or peripneumony. This diſeaſe may alſo terminate in a ſuppuration, gangrene, or ſchirrus. A frothing at the mouth, the tongue vaſtly ſwelled, and of a purple, blackiſh colour, portend death.

The quinzy is generally diſtinguiſhed by modern writers into the idiopathic and ſymptomatic. The firſt, where it is itſelf the diſeaſe, and owes its origin only to a plethora; the ſecond, where it is but the accidental ſymptom of an inflammatory fever, or ſome other diſeaſe, about the time of its criſis. See the article INFLAMMATORY FEVERS.

Dr. Mead diſtinguiſhes the quinzy into three ſorts; the firſt of which he calls the watery quinzy; the ſecond, a gangrene of the tonſils; and the third a ſtrangulation of the fauces. In the firſt ſort, the glands of the mouth, palate, and neighbouring parts are ſwoln. In the ſecond, an inflammation without a perfect ſuppuration ſeizes the tonſils, which ſwell and grow hard; a gangrene ſoon enſues, which, if not ſpeedily relieved, proves fatal. See GANGRENE.

In the third ſort, all the nerves are convulſed,

vulſed, and the patient drops down dead ſuddenly: however this ſpecies of the quinzy, though deſcribed by Hippocrates, is yet very rare. If it can be foreſeen, it ought to be prevented by evacuations of all kinds; that is, bleeding, purging, bliſtering, iſſues, and diuretics; and it will be of ſervice to practiſe abſtinence, or a moderation in eating and drinking.

In the watery-quinzy, which ſometimes rages like an epidemic fever eſpecially in places near the ſea, bleeding plentifully as ſoon as poſſible is recommended; afterwards clyſters, gentle purges, bliſters under the chin, and on the ſides of the neck; and if this courſe does not ſucceed, the palate muſt be pretty deeply ſcarified about the tongue and ſublingual veins.

In theſe inflammations in general, a ſlight diarrhœa relieves the patient, according to Arbuthnot. Therefore aliments which promote it are of ſervice; ſuch are tamarinds infuſed in whey, decoctions of farinaceous vegetables moderately acidulated, and ſuch as abound with a cooling nitrous ſalt are uſeful. Burnet is ſaid to be a ſpecific in the quinzy; mulberries, and all acids are beneficial. The mouth and throat muſt be kept moiſt, and the noſe clear, that the air may have a free paſſage thro' it. Sydenham orders to bleed plentifully in the arm, and Boerhaave directs it to be by a large orifice. Afterwards a ſublingual vein ſhould be opened; but, according to Hoffman, bleeding in the jugular yields the beſt aſſiſtance. If the ſymptoms continue to be very urgent, the bleeding may be repeated in ſix or eight hours time, till they begin to be more mild. After the firſt bleeding, Sydenham orders a ſtrong and large bliſter to be laid to the neck: then let the parts inflamed be touched with the following mixture. Take honey of roſes, as much as you pleaſe; and mix it with as much ſpirit of ſulphur as is ſufficient to give it the greateſt ſharpneſs. Afterwards the following gargle is to be held in the mouth till it is hot; and is to be repeated pretty often: take plantain-water, and frog-ſpawn, of each four ounces; red roſes, four ounces; the whites of three eggs beat in water; and two drams of cryſtal ſugar.

When the fauces are dry, hot, and the tongue ſwells, with difficulty of breathing and ſwallowing, Hoffman orders to take of the whites of eggs beat in water, two ounces; water of roſes, one ounce; ſal prunella, twelve grains; ſyrup of quinces, one ounce. Make a linctus, which is to be taken often; and let the neck be anointed as well behind as before with the following camphorated oil. Take of the oil of ſweet almonds, one ounce; oil of white poppies, one dram; camphor, half a dram; after which let the patient take a cooling emulſion.

Boerhaave, after bleeding, orders a ſtrong purge, and if that cannot be taken, a ſtrong clyſter. Emollient ſteams, or even the ſteam of hot water taken in at the mouth is beneficial. If the patient is not able to ſwallow any nouriſhment, take of good broth of fleſh-meat, ten ounces; nitre, ten grains; ſpirit of ſalt, ſix drops; make a clyſter to be injected every eight hours, and retained as long as is poſſible. Hoffman ſays, that if the tumour tends to a ſuppuration, it is beſt promoted by holding dried figs in the mouth, and that when the tonſils are full of an inflammatory ichor, honey of roſes, mixt with ſpirit of vitriol, and often applied to the part with a pencil, is excellent. In a latent internal exceeding hot quinzy, the mouth muſt be frequently moiſtened with milk or cream, with an addition of ſal prunella, and ſyrup of poppies.

Dr. Pringle obſerves, that the inflammatory quinzy is the moſt frequent, as well as dangerous among ſoldiers, upon their firſt encampment; and that its tendency to bring on a ſuffocation, indicates the neceſſity of ſpeedy and large bleedings, purging, and bliſtering. He alſo recommends the following application, as one of the moſt efficacious remedies in this terrible diſorder: let a piece of thick flannel be moiſtened with equal parts of any common oil and of ſpirit of hartſhorn, and applied to the throat, to be renewed once in four or five hours: this medicine, he tells us, he had from Dr. Young, phyſician in Edinburgh. By means of this application, the neck, and ſometimes the whole body, is put into a ſweat; which, after bleeding, either carries off or leſſens the inflammation. He alſo tells us, that he has obſerved little benefit ariſing from gargles, and that the acid ones did more harm than good: however, a decoction of figs in milk and water, eſpecially if the ſpirit of ſal ammoniac be added, ſerves to thin the ſaliva, whereby the glands ſecrete more freely; a circumſtance always conducive to the cure.

In the philoſophical tranſactions, the jelly of black currants, ſwallowed down leiſurely in ſmall quantities, is aſſerted to be a ſpecific for a quinzy; and a decoction of the leaves or bark in milk, when the jelly cannot be had, uſed as a gargle, is ſaid to cure all the inflammatory diſtempers of the throat that happen in the winter-time.

In malignant fevers, when there is an inflammation of the oeſophagus, Hoffman orders to take nitre, one dram; camphor, three grains; ſugar, one ounce; make a powder, which is to be given in an emulſion of ſweet almonds, and may alſo be held in the mouth for ſome time before it is ſwallowed. That inflammatory pain which ariſes from a ſharp ſalt ſerum in the glandulous parts of the fauces with redneſs and a copious flux of ſaliva, but without a fever, may be cured with a gargle of brandy alone. When there is a large defluxion of an impure ſerous humour upon the fauces, it requires a frequent uſe of gentle laxatives. When the ſymptoms of a quinzy are ſo urgent, that the patient is in immediate danger of ſtrangling, recourſe muſt be had to bronchotomy, or opening of the windpipe. See BRONCHOTOMY.

The method of preventing an inflammation of the uvula, in a prolapſion thereof, from ſpreading through the fauces and exciting a quinzy, may be ſeen under the article PROLAPSUS UVULÆ.

QUIIRE of paper, the quantity of 24 or 25 ſheets.

QUIRISTER, or CHOIRISTER, a perſon appointed to ſing in the choir of a cathedral. See CHANTOR, CHOIR, &c.

QUIRINALIA, in antiquity, a feaſt celebrated among the Romans in honour of Romulus, who was called Quirinus. Theſe feaſts were held on the 13th of the calends of March.

QUIRITES, in antiquity, a name given to the people of Rome, chiefly the common citizens, as diſtinguiſhed from the ſoldiery.

QUIRK, in building, a piece of ground taken out of any regular ground-plot, or floor: thus if the ground-plot were oblong or ſquare, a piece taken out of a corner to make a court or yard, &c. is called a quirk.

QUI-TAM, in law, is where an action is brought, or an information exhibited againſt a perſon, on a penal ſtatute at the ſuit of the king, and the party or informer, when the penalty for breach of the ſtatute is directed to be divided between them; in that caſe, the informer proſecutes as well for the king as himſelf.

QUIT-CLAIM, in law, ſignifies a releaſe of any action that one perſon has againſt another. It ſignifies alſo a quitting a claim or title to lands, &c.

QUIT-RENT, in law, a ſmall rent that is payable by the tenants of moſt manors, whereby the tenant goes quit and free from all other ſervices; and it is ſaid to be an acknowledgment, in token of ſubjection to the lord. Antiently this payment was called white rent, on account that it was paid in ſilver-coin, and to diſtinguiſh it from rent-corn.

QUITTANCE. See ACQUITTANCE.

QUITTER-BONE, among farriers, a hard round ſwelling upon the coronet of a horſe's foot, or between the heel and the quarter; ſometimes occaſioned by gravel under the ſhoe; or by a bruiſe, ſtab, or prick of a nail. This ſwelling comes to a head in four or five days, and breaks out with matter at a little deep hole, like a fiſtula.

QUOAD HOC, is a term uſed in the pleadings and arguments of lawyers; being as much as to ſay, as to this thing the law is ſo and ſo, &c.

QUOD *clerici non eligantur in officio ballivi*, is a writ that lies for a clerk, who, on account of lands he is poſſeſſed of, is created bailiff, or ſome other like officer.

QUOD *ei deforceat*, a writ that lies for a tenant in tail, tenant in dower, or for term of life, having loſt lands by default, againſt the perſon who recovered, or againſt his heir. It is ſaid, this writ may be likewiſe brought againſt a ſtranger; as where a perſon recovers by default, and then makes a feoffment of the land; in that caſe, the feoffee is anſwerable, &c. and when a tenant in tail, or any tenant that has a particular eſtate in the lands, loſes on a default where he is not ſummoned, &c. he may have either a diſceit or this writ, though his heirs after his death ſhall not have it, but are to bring a formedon.

QUOD *permittat*, in law, a writ which lies for the heir of him that is diſſeiſed of common or paſture, againſt the heir of the diſſeiſor who is dead. And it is held, that where a perſon's anceſtor died ſeiſed, or if one be diſturbed by another in his common of paſture, or other ſuch thing annexed to his inheritance, he ſhall have this writ againſt the deforcer.

QUOD *non permittat*. See the article CONSUETUDINIBUS.

QUOD *perſona nec prebendarii*, &c. a writ that lies for ſpiritual perſons, when diſtrained in their ſpiritual poſſeſſions, for the payment of a fifteenth, with the reſt of the pariſh.

QUOIL, or COIL, in the ſea-language, a rope or cable laid up round, one fack or turn over another, ſo that it may the more eaſily be ſtowed out of the way, and alſo run out free and ſmooth, without twiſtings or doublings.

QUOIN, or COIN, on board a ſhip, a wedge faſtened on the deck cloſe to the breech of the carriage of a gun, to keep it firm up to the ſhip ſide.

Cantic quoins are ſhort three-legged quoins put between caſks to keep them ſteady.

QUOINS, in architecture, denote the corners of brick or ſtone walls. The word is particularly uſed for the ſtones in the corners of brick-buildings. When theſe ſtand out beyond the brick-work, their edges being chamfered off, they are called ruſtic quoins.

QUOITS, a kind of exerciſe or game known among the antients under the name diſcus. See the article DISC.

QUO JURE, in law, a writ that lies where a perſon has lands in which another claims common of paſture time out of mind; and it is brought in order to compel the perſon to ſhew by what title he challenges the common.

QUO MINUS, is alſo a writ which iſſues out of the court of exchequer to the king's farmer or debtor, for debt, treſpaſs, &c. Though this writ was formerly granted only to the king's tenants or debtors, the practice now is become general for the plaintiff to ſurmiſe, that by the wrong the defendant does him, he is the leſs able to ſatisfy his debt to the king, by which means juriſdiction is given to the court of exchequer to determine the cauſe. This writ is to take the body of the defendant in like manner as the capias in the common pleas, and the writ of latitat in the king's bench.

QUORUM, a word frequently mentioned in our ſtatutes, and in commiſſions both of juſtices of the peace and others. It is thus called from the words of the commiſſion, *quorum* A. B. *unum eſſe volumus*. For an example, where a commiſſion is directed to ſeven perſons, or to any three of them, whereof A. B. and C. D. are to be two; in this caſe, they are ſaid to be of the quorum, becauſe the reſt cannot proceed without them: ſo a juſtice of the peace and quorum is one without whom the reſt of the juſtices in ſome caſes cannot proceed.

QUOTATION, in literature, a citation, or paſſage, rehearſed expreſsly in one author from another.

Quotations are uſually diſtinguiſhed by inverted commas.

QUOTIDIAN, *quotidiana*, in medicine, an intermitting fever, or ague, the paroxyſm or fit whereof returns every day. See the article INTERMITTENT.

This ſpecies of intermittent fevers is not ſo common as the tertian and quartan. See TERTIAN and QUARTAN.

It attacks the patient early in the morning, with chilneſs and ſhivering; to which ſucceed a cardialgia, nauſea, and inflation of the belly; in ſome a pain in the head, in others fainting fits, and in moſt vomiting or ſtools, or both; after which comes on the hot fit, with thirſt.

As to the cure, the beſt method ſeems to be firſt to attenuate the tough and vitiated humours in the ſtomach and inteſtines, by proper doſes of vitriolated tartar, and the like; after which a gentle emetic, diaphoretics and diluents are to be adminiſtered; and laſtly, the bowels are to be ſtrengthened by bitters and ſubaſtringents; among which, the peruvian bark claims a place, only to be uſed in ſmaller quantities than when truſted to alone for the cure.

QUOTIENT, in arithmetic, the number which ariſes by dividing the dividend by the diviſor. See DIVISION.

QUO WARRANTO, in law, a writ which lies againſt a perſon or corporation, that uſurps any franchiſe or liberty againſt the king; as to have a fair, market, or the like, in order to oblige the uſurper to ſhew by what right and title he holds or claims ſuch franchiſe.

This writ alſo lies for miſ-uſer, or non-uſer of privileges granted.

The attorney-general may exhibit a quo-warranto in the crown-office againſt any particular perſons, or bodies politic or corporate, who uſe any franchiſe or privilege, without having a legal grant, or preſcription for the ſame; and a judgment obtained upon it is final, as being a writ of right.

The END of the THIRD VOLUME.

MVSEVM BRITANNICVM

Collated & Perfect
J. R.
1783.